FORMATO EUROPEO PER IL CURRICULUM VITAE

INFORMAZIONI PERSONALI

Nome	**SAROTTO MASSIMO**
Indirizzo	
Telefono	
E-mail	
Nazionalità	
Data di nascita	

ESPERIENZA LAVORATIVA

• Date (da – a)	Da Marzo 2001 ad oggi
• Nome e indirizzo del datore di lavoro	ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile - Da Settembre 2013 ad oggi presso Centro Ricerche Saluggia, Strada per Crescentino 41, 13040 Saluggia (VC) - Da Marzo 2001 ad Agosto 2013 presso Centro Ricerche Bologna, Via Martiri di Monte Sole 4, 40129 Bologna
• Tipo di azienda o settore	Dipartimento: Fusione e Tecnologie per la Sicurezza Nucleare (FSN) Divisione: Sicurezza e sostenibilità del Nucleare (SICNUC). Laboratorio: Progettazione e Supporto Tecnico per la Sicurezza e la Sostenibilità Nucleare (PSSN)
• Tipo di impiego	Ricercatore ENEA da gennaio 2009 (Funzionario dal 12/03/2001 al 31/12/2008)
• Principali mansioni e responsabilità	Le attività di ricerca dal 2001 ad oggi si sono svolte nell'ambito dell'analisi neutronica di sistemi nucleari innovativi ed appartengono a **due filoni principali**. a) **Progettazione ed analisi dei reattori nucleari avanzati di IV generazione refrigerati a piombo** (Lead-cooled Fast Reactor, LFR) e dei sistemi sottocritici pilotati da acceleratore (Accelerator Driven System, ADS) finalizzati alla sostenibilità dell'energia nucleare tramite la chiusura del ciclo del combustibile. Le prime attività di analisi neutronica per i sistemi ADS, mediante modellistica e simulazione con codici di calcolo deterministici (ERANOS) e stocastici (MCNP), si sono svolte per i progetti: - TRADE (2002-2004) basato su un'idea di Carlo Rubbia (all'epoca presidente ENEA); - ADS-DF (Demonstration Facility) in collaborazione con ANSALDO (2001-2003); - PDS-XADS nell'ambito del 5° programma quadro EURATOM (2001-2004); oltre ai progetti sul LFR svolti nell'ambito dell'Accordo di Programma (AdP) ENEA-MiSE. Successivamente, grazie alla consolidata esperienza neutronica e alle buone conoscenze di termoidraulica (in condizioni nominali e nei transitori accidentali per gli studi di sicurezza), ha assunto ruoli di responsabilità in gruppi di lavoro nazionali ed internazionali dedicati alla progettazione di nocciolo ed alla caratterizzazione di questi sistemi nucleari avanzati: LFR e ADS refrigerati a piombo o con l'eutettico piombo-bismuto. In sintesi: - Dal 2014 ad oggi ha contribuito alla progettazione di nocciolo a livello ingegneristico del dimostratore europeo del LFR (ALFRED) nell'ambito del consorzio internazionale FALCON (Fostering the ALfred CONstruction) siglato da ENEA, ANSALDO e ICN (Romania).

- Dal 2005 al 2018 ha partecipato a progetti EURATOM del 6-7° programma quadro (Framework Programme FP6-7) e Horizon 2020 (H2020), quali: EUROTRANS ed ELSY (FP6), CDT, MAXSIMA e FREYA (FP7), MYRTE (H2020).

- Nel progetto FP6 EUROTRANS (2005-10), ha contribuito al progetto concettuale e svolto le analisi neutroniche di un ADS da 400 MW (EFIT) refrigerato a piombo e finalizzato al bruciamento degli attinidi minori (Am, Np, Cm).
- Nel progetto FP6 ELSY (2006-09), ha svolto attività di analisi e progettazione nocciolo per un LFR da 1500 MW (termici) finalizzato alla produzione di energia elettrica. Ha inoltre collaborato con ANL (USA) per lo studio preliminare di un dimostratore da 100 MW.
- Durante il progetto FP7 CDT (Central Design Team; 2009-12), da marzo 2010 a giugno 2012 si è trasferito presso il centro ricerche nucleare belga (SCK-CEN, Mol) dove ha coordinato un team internazionale multidisciplinare nelle attività di progettazione di nocciolo del reattore MYRRHA – operante in modalità sia critica sia sottocritica (ADS) – e nella successiva caratterizzazione neutronica, termoidraulica e termomeccanica. Le attività di progettazione ed analisi (inclusi calcoli di schermaggio ed attivazione per l'intero reattore fino allo schermo biologico) sono proseguite nel progetto FP7 MAXSIMA (2012-2016), dove ha definito e caratterizzato le 4 configurazioni dei noccioli minimo e massimo di MYRRHA in entrambe le modalità operative (come inviluppo per gli studi di sicurezza) e fornito tutti i parametri neutronici necessari per le analisi dei transitori incidentali più significativi.
- Nel progetto FP7 FREYA (2012-16), ha progettato una configurazione critica di nocciolo del reattore sperimentale a potenza zero VENUS-F (presso SCK-CEN, Mol) "rappresentativa" di ALFRED (in primis per lo spettro neutronico) e coordinato le successive analisi dei parametri neutronici misurati e riprodotti con simulazioni mediante codici deterministici (ERANOS) e stocastici (MCNP, Serpent). Le attività sperimentali e di simulazione sono proseguite nel progetto H2020 MYRTE (2015-18) per altre configurazioni del reattore VENUS-F rappresentative di MYRRHA operante in modalità critica e sottocritica.
- Dal 2015 al 2018 ha contribuito all'AdP ENEA-MiSE con attività relative alla campagna di validazione di codici neutronici (e alla loro corretta applicazione ai sistemi LFR) basata sui risultati sperimentali ottenuti nel progetto FP7 FREYA e nei test eseguiti nel reattore LR-0 presso il centro di ricerca CVR (Rep. Ceca).
- Dal 2019 ad oggi ha contribuito all'attività di "aggiustamento" delle librerie di dati nucleari al fine di migliorare l'accuratezza degli strumenti neutronici utilizzati in ENEA per la progettazione di nocciolo del LFR. Selezionando le misure più rappresentative del reattore ALFRED disponibili nel database IRPhE dell'OECD, con il codice ERANOS ha simulato numerosi

esperimenti ed eseguito analisi di sensibilità e incertezza per valutare l'impatto delle incertezze dei dati nucleari sui parametri (integrali e locali) misurati e calcolati.

- Dal 2018 ad oggi ha coordinato un'attività di benchmark sul reattore ALFRED tra codici deterministici (ERANOS) e stocastici (Serpent) in collaborazione con il Politecnico di Torino, dove ha anche tenuto un "Corso di Eccellenza" per dottorandi sulle metodologie e strumenti di calcolo per la progettazione di nocciolo del LFR (6-8 maggio 2019).
- Negli anni 2019-20 ha contribuito al progetto di nocciolo di tre diversi sistemi LFR per Westinghouse LTD: un prototipo alimentato ad ossido di uranio (UO_2, da 730 MW) e due LFR commerciali da 950 MW (alimentati ad UO_2 e nitruri). Ha svolto analisi neutroniche con il codice ERANOS e termoidrauliche con il codice ANTEO+ sviluppato in ENEA.

b) **Progettazione di sistemi nucleari finalizzati alla radioterapia oncologica** mediante modellistica, simulazione e calcoli dosimetrici con il codice MCNP. In particolare:

- Dal 2001 al 2006 ha svolto attività di ricerca sulle applicazioni BNCT (Boron Neutron Capture Therapy) utilizzando sia sorgenti compatte – acceleratori Deuterio-Deuterio (DD) che producono neutroni di 2.45 MeV di energia tramite la reazione di fusione DD – sia il reattore sperimentale TAPIRO (ENEA Casaccia). Le attività sulle sorgenti compatte sono state condotte in collaborazione con l'INFN, l'ospedale Molinette ed il Consorzio EUROSEA di Torino. Nelle attività su TAPIRO (co-finanziate dal MiUR) ha contribuito alla progettazione della colonna epitermica (costruita ed assemblata nel 2005) in cui i neutroni provenienti dal nocciolo vengono moderati e convogliati verso la finestra di irraggiamento.
- Nel 2018 è stato promotore della collaborazione con TheranostiCentre Srl (TC) per studi di ricerca finalizzati alla radioterapia intra-operatoria (IORT) con neutroni veloci (nIORT®). Dal 2019 è membro (consigliere scientifico) dell'Advisory Board di TC, la collaborazione ENEATC è stata formalizzata (ENEA/2019/25134/FSN-ING) e parte delle attività finanziate nell'ambito del progetto LINCER (Laboratorio per la caratterizzazione di Irradiatori Neutronici Compatti in Emilia Romagna; 2019-21). A differenza della BNCT in cui si utilizzano neutroni epitermici per irraggiare organi "in situ", nella nIORT® il letto tumorale viene irraggiato a ferita aperta (dopo l'asportazione chirurgica del primario) con neutroni veloci, molto efficaci nel danneggiare le cellule cancerogene grazie all'elevata efficacia biologica (Relative Biological Effectiveness, RBE). Egli ha contribuito alla progettazione della sorgente: un acceleratore di ioni D+ da 100 kV-10 mA DC, costruito dalla Berkion Technology LLC (BT, USA) ed inviato al centro ricerche ENEA del Brasimone (BO) a fine 2021, dove è attualmente in fase di assemblaggio per l'inizio della fase sperimentale.

Con accurate simulazioni MCNP, ha progettato gli schermi della sorgente ed ottimizzato il collimatore da cui viene estratto il fascio tramite una finestra circolare di diametro variabile (1□6 cm). L'elevato flusso alla finestra di irraggiamento (□10^8 cm^{-2} s^{-1}) e l'elevata RBE dei neutroni veloci (□ 16 a 2.45 MeV, vs. 1 dei fotoni nella radioterapia convenzionale) consentono di somministrare livelli di dose di 10□20 Sv (o Gy (RBE), end-point clinici tipici della IORT con elettroni e raggi X) in soli 5□15 minuti. Le ridotte dimensioni (e peso) del sistema ne permettono la movimentazione da remoto tramite braccio robotico e lo rendono potenzialmente idoneo ai trattamenti nIORT® di quasi tutti gli organi/parti del corpo. L'apparato è oggetto di brevetto internazionale PCT depositato a luglio 2021 da TC, ENEA e BT (PCT/IT2021/000032).

Oltre ai due filoni principali di ricerca (descritti nei punti a e b), si può menzionare che:

- dal 2007 al 2009 ha svolto calcoli di schermaggio ed attivazione con il codice deterministico TORT per il reattore modulare di piccola / media taglia IRIS, uno SMR da 350 MW elettrici di proprietà di Westinghouse (refrigerato ad acqua pressurizzata). L'attività era inserita nell'iniziativa GNEP (Global Nuclear Energy Partnership) del DOE (USA) e nell'AdP ENEAMiSE. Quest'ultimo prevedeva anche degli studi di scenario per il ciclo del combustibile del LFR: tali attività sono state svolte con i codici ERANOS e CO.SI.;
- da giugno 2015 ad agosto 2019 è stato Responsabile di Fisica Sanitaria (RFS) per il Piano di Emergenza Esterna (PEE) dell'impianto EUREX SOGIN (Saluggia, VC). Nelle simulazioni per il PEE, ha coordinato le squadre radiometriche su mezzi mobili (per effettuare i controlli nei settori coinvolti dall'incidente) ed elaborato le misurazioni trasmesse;
- ha svolto attività di referaggio di articoli scientifici per le riviste Elsevier Applied Radiation and Isotopes (2009) e Nuclear Engineering and Design (2017) e la rivista ASME Journal of Nuclear Engineering and Radiation Science (2021);
- da novembre 2018 è Liaison Officer della OECD-NEA Data Bank per il centro ricerche ENEA di Saluggia.

Luglio-Agosto 2004 - 2006, Luglio-Agosto 2008

Alpha Test S.r.l., Via Mercalli 14, 20122 Milano

Orientamento e Formazione

Docente dei corsi di Matematica e Fisica per la preparazione ai test di ingresso per l'Università
(Bologna)

Giugno 1990 - Marzo 1991

Esercito Italiano RMNO (Regione Militare Nord-Ovest), Caserma Ettore de Sonnaz, Torino
Servizio Militare (Fanteria)

Realizzazione di Data Base (DB III) per l'amministrazione della RMNO

Agosto 1989 - Aprile 1990

Informatica System S.r.l., Piazzetta del Borgo 1, 12080 Vicoforte (CN)

Programmatore

Realizzazione di pacchetti software per il laboratorio di Fisica delle scuole secondarie.

ISTRUZIONE E FORMAZIONE

• Date (da – a)	Gennaio 2009 - Marzo 2010
• Nome e tipo di istituto di istruzione o formazione	ALMA MATER STUDIORUM UniBo, Facoltà di Ingegneria, Via Zamboni 33, 40126 Bologna (in collaborazione con ENEA)

• Principali materie / abilità professionali oggetto dello studio	Ingegneria Nucleare: Progettazione e gestione di sistemi nucleari avanzati
• Qualifica conseguita	Master II livello

Febbraio 1998 - Marzo 2001

Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino (in collaborazione con INRiM).
Misurazioni gonio-spettro-fotometriche delle proprietà di riflessione / trasmissione dei materiali: campagna sperimentale, analisi statistica delle misure, simulazioni con tecniche “ray tracing” e “radiosity”, applicazioni in ambito illuminotecnico e di computer grafica.
Dottorato di Ricerca

Novembre 1996 - Febbraio 1998

INRiM, Istituto Nazionale di Ricerca Metrologica, Strada delle Cacce 91, 10135 Torino; fino a Dicembre 2005: Istituto Elettrotecnico Nazionale (IEN) Galileo Ferrraris.
Gonio-fotometria dei materiali ed applicazioni illuminotecniche
Borsa di addestramento alla Ricerca

Settembre - Novembre 1998

University of Cambridge, International Examinations (in collaborazione con Politecnico di Torino)
Preliminary English Test
PET with merit

Aprile - Ottobre 2006

ENEA in collaborazione con INNOVA e ISNOVA (Bologna)
Corso per Manager di Progetti Europei

Marzo - Ottobre 2001

ENEA in collaborazione con MTA SHL Italia (Roma)
Ciclo di formazione sulle abilità trasversali: analisi organizzativa, team working, comunicazione interpersonale, comunicazione scritta nei contesti organizzativi, reporting, project management.

Settembre 1990 - Marzo 1996

Università degli Studi di Torino, Facoltà di Fisica, Via Pietro Giuria 1, 10125 Torino
Laurea in Fisica (110 lode)

Settembre 1984 - Luglio 1989

Istituto Istruzione Superiore “G. Vallauri”, Via S. Michele 68, 12045 Fossano (CN)
Diploma di Perito Informatico (56/60)

CAPACITÀ E COMPETENZE PERSONALI

MADRELINGUA	**ITALIANO**
ALTRE LINGUE	
	INGLESE
• Capacità di lettura	ECCELLENTE
• Capacità di scrittura	BUONA

• Capacità di espressione orale	BUONA
	FRANCESE
• Capacità di lettura	BUONA
• Capacità di scrittura	BASE
• Capacità di espressione orale	BASE
CAPACITÀ E COMPETENZE TECNICHE	Studio e progettazione di sistemi nucleari innovativi. Esperienza ventennale nell'utilizzo di codici neutronici (deterministici e stocastici), di scenario (per il ciclo del combustibile), di termoidraulica, di schermaggio ed attivazione, tra i quali: - ERANOS (European Reactor ANalysis Optimised System), sviluppato dal CEA (Francia); - MCNP (Monte Carlo N-Particle transport code), sviluppato da LANL (USA); - TORT (Three-dimensional discrete ORdinates Transport code) sviluppato dal ORNL (USA); - ANTEO+ (ANalisi TErmoidraulica Ottimizzata) sviluppato dal ENEA; - CO.SI. (Scenarios code for the sustainability of nuclear energy) sviluppato dal CEA. Utilizzo dei sistemi operativi Unix/Linux e Windows (DOS). Conoscenza dei linguaggi di programmazione: C, Fortran, Python, Pascal, Visual Basic, Cobol e Lab View. Utilizzo dei pacchetti software: Office, Mathematica, MatLab, 3D Studio Max (grafica), Solstis (ottica).
CAPACITÀ E COMPETENZE RELAZIONALI	BUONA ABILITÀ NEL PARLARE IN PUBBLICO Esperienza ventennale nella presentazione dei lavori di ricerca a conferenze e in gruppi di lavoro internazionali (progetti EURATOM, meeting IAEA e gruppi di lavoro OECD NEA). Eccellente abilità nella divulgazione scientifica ed in particolare per la fisica classica, la meccanica quantistica, la relatività speciale e generale. Negli anni 1998-2007 ha tenuto numerosi corsi presso associazioni culturali in Torino e nel 1999 un ciclo di lezioni nell'ambito di un progetto con il Liceo scientifico di Pinerolo (TO).
CAPACITÀ E COMPETENZE ORGANIZZATIVE .	Consolidata esperienza in ruoli di responsabilità e coordinamento in gruppi di lavoro internazionali finalizzati alla progettazione di sistemi nucleari avanzati. Inoltre: - ha organizzato corsi presso associazioni culturali ed eventi culturali, tra cui una mostra d'arte del pittore Carlo Sismonda presso Palazzo Salmatoris a Cherasco (CN) nel 1998; - è stato presidente del seggio elettorale del comune di Narzole (CN) dal 2000 al 2005.
CAPACITÀ E COMPETENZE ARTISTICHE.	Ha realizzato siti web per associazioni culturali e presentazioni (Power Point) per seminari ed eventi culturali. Discreta abilità nel disegno artistico.
ALTRE CAPACITÀ E COMPETENZE	Collaborazione con associazioni culturali con ruolo di docenza in corsi multidisciplinari: arte e scienza come strumenti per lo sviluppo del potenziale umano.
PATENTE	B
ULTERIORI INFORMAZIONI	Per referenze: ENEA, Centro di ricerca nucleare belga SCK-CEN, INRIM Torino
APPENDICI	1) Brevetto Internazionale PCT, Docenza Corsi post-universitari (2) e Lectures (2) 2) Pubblicazioni Scientifiche: Articoli per Riviste e Proceedings di Conferenze Internazionali (66), Rapporti Tecnici (80), altre presentazioni a meeting, workshop e gruppi di lavoro internazionali (22)

3) Participazione a Scuole / Corsi Internazionali (5)
4) Attività di ricerca svolta presso IEN e Politecnico di Torino (1996-2001)
5) Additional information on research activities in ENEA (2001-2021)

1) Appendice 1 – Brevetto Internazionale PCT (B01), Docenza Corsi post-universitari (C01-02) e Lectures (L01-02)

B01) **Multi Purpose Compact Apparatus for the Generation of a high-flux of neutrons, particularly for Intraoperative Radiotherapy** M. Martellini, G. Gherardi, K. Leung, J. Leung, M. Sarotto, A. Rizzo, 5 luglio 2021. Patent Cooperation Treaty (PCT): International application n. PCT/IT2021/000032.

C02) **Development of Gen-IV LFR: methodology and calculation tools for the core design**
M. Sarotto, G. Grasso, **Corso di Eccellenza per Dottorandi**, Politecnico di Torino, 6-8 maggio 2019 (https://didattica.polito.it/pls/portal30/gap.pkg_guide.viewGap?p_cod_ins=01TZBIV&p_a_acc=2019&p_header=S&p_lang=IT&multi=N).

C01) **The physical principles of ERANOS deterministic code and its application to the LFR and VENUS-F critical cores**
M. Sarotto. **Corso** presso **SCK-CEN Academy for nuclear science and technology,** EURATOM FP7 FREYA WP5 session for training and education**,** 22-26 febbraio 2016, Mol (B).

L02) **Neutronic analyses of the MYRRHA-MAXSIMA minimum and maximum cores in critical and subcritical modes: an envelope for safety studies**
M. Sarotto. **Lecture** presso **EURATOM FP7 SEARCH/MAXSIMA International Workshop,** 7-10 ottobre 2014, **KIT** Karlsruhe (G).

L01) **An outcome of the EU FP7 CP CDT: the MYRRHA-FASTEF FA/core design**
M. Sarotto. **Lecture** presso **International Workshop on "Innovative Nuclear Reactors cooled by Heavy Liquid Metals: Status and perspectives,** organizzato da ENEA-MiSE ed EU FP7 EC SEARCH, 17-20, aprile 2012, **Università di Pisa** (I).

2) Appendice 2 – Pubblicazioni Scientifiche: Articoli per Riviste e Proceedings Conferenze Internazionali (P01-66), Rapporti Tecnici ENEA (E01-76) e IEN (I01-04), altre presentazioni a meeting, workshop e gruppi di lavoro internazionali (W01-22)

2.1) Articoli per Riviste e Proceedings Conferenze Internazionali

P066) **Realisation of an adjusted nuclear data library based on ENDF/B-VIII.0 nuclear data evaluations for the ALFRED core**
D. M. Castelluccio, F. Lodi, V. Peluso, G. Grasso, M. Sarotto. Accepted at Int. Conf. **IAEA FR22** on FAST REACTORS AND RELATED FUEL CYCLES: SUSTAINABLE CLEAN ENERGY FOR THE FUTURE (Beijing, 2022), Paper CN291-422.

P065) **ENDF/B-VIII.0 nuclear data sensitivity and uncertainty analysis (S/U) of key safety-relevant reactivity coefficients for the ALFRED core**
D. M. Castelluccio, F. Lodi, V. Peluso, G. Grasso, M. Sarotto. Accepted at Int. Conf. **IAEA FR22** on FAST REACTORS AND RELATED FUEL CYCLES: SUSTAINABLE CLEAN ENERGY FOR THE FUTURE (Beijing, 2022), Paper CN291-421.

P064) **Neutronic analyses of the FREYA experiments in support of the ALFRED lead-cooled fast reactor core design and licensing** M. Sarotto, G. Firpo, A. Kochetkov, A. Krasa, E. Fridman, J. Cetnar, G. Domanska. ASME **Journal of Nuclear Engineering and Radiation Science** Vol. 6 No 1; 011402, January 2020 (ISSN 2332-8975 (web) 2332-8983 (print); https://doi.org/10.1115/1.4044000).

P063) **Extension of the "42-0" approach to ternary fuels and application to a thorium-fed, minor-actinides-burner ADS** G. Grasso, M. Sarotto, F. Lodi, D. M. Castelluccio, R. Pergreffi, D. Giusti. **European Physics Journal Plus** Vol. 134(12), 601, December 2019 (ISSN 2190-5444; https://doi.org/10.1140/epjp/i2019-13014-4).

P062) **An improved design for the ALFRED core**
G. Grasso, M. Sarotto, D. M. Castelluccio, F. Lodi. Proc. of **ICAPP'19**, 2019 Int. Congress on the Advances in Nuclear Power Plans, May 12-15, 2019, Juan-Les-Pins (France).

P061) **The neutronic modelling of the VENUS-F critical core experiments with the ERANOS deterministic code (FREYA EU FP7 project)**
M. Sarotto, A. Kochetkov, A. Krása, G. Bianchini, V. Fabrizio, M. Carta, V. Peluso, G. Vittiglio, J. Wagemans. Elsevier Journal **Annals of nuclear Energy** Vol. 121, pg. 626-637, July 2018 (ISSN 0306-4549; https://doi.org/10.1016/j.anucene.2018.07.046).

P060) **Neutron propagation experiments with a lead test section inserted in the core of the LR-0 reactor**
E. Losa, M. Kostal, V. Rypar, B. Jansky, E. Novak, G. Grasso, M. Sarotto, F. Lodi. Elsevier Journal **Nuclear Engineering and Design** Vol. 335, pg. 151-160, May 2018 (ISSN 0029-5493; https://doi.org/10.1016/j.nucengdes.2018.05.022).

P059) **FP7-MAXSIMA WORK PACKAGE 2 "Safety analysis in support of MYRRHA" Main Outcome and Conclusions**
D. Castelliti, M. Sarotto, A. Rineiski, A. Ferrari, S. Mueller, G. Bandini, M. Polidori, E. Bubelis, W. Jaeger, T. Hamidouche, F. Belloni, X. N. Chen, I. Pasichnyk, D. Lopez. Proc. of **NURETH-17**, 17th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, September 3-8, 2017, Xi'an (China).

P058) **Safety studies for the MYRRHA critical core with the SIMMER-III code**
X-N. Chen, R. Li, F. Belloni, F. Gabrielli, A. Rineiski, L. Andriolo, L. Guo, D. Castelliti, M. Schyns, E. Bubelis, G. Bandini, M. Sarotto. Elsevier Journal **Annals of nuclear Energy** Vol. 110, pg. 1030-1042, August 2017 (ISSN 0306-4549; https://doi.org/10.1016/j.anucene.2017.08.021).

P057) **Impact of an Accidental Control Rod withdrawal on the ALFRED core: tri-dimensional neutronic and thermal-hydraulic analyses**
M. Sarotto, G. Grasso, F. Lodi, G. Bandini, M. Sumini. Proc. of **IAEA FR17**, Int. Conf. on Fast Reactors and related fuel cycles: next generation nuclear systems for sustainable development, June 26-29, 2017, Yekaterinburg (Russian Federation).

P056) **On the allowed sub-criticality level of lead (-bismuth) cooled ADS: the EU FP6 EFIT and FP7 FASTEF cases** M. Sarotto. Elsevier Journal **Annals of nuclear Energy** Vol. 102, pg. 440-453, January 2017 (ISSN 0306-4549; https://doi.org/10.1016/j.anucene.2016.12.028).

P055) **Recent MYRRHA Safety studies with the SIMMER code**
X. N. Chen, R. Li, F. Gabrielli, A. Rineiski, L. Andriolo, L. Guo, D. Castelliti, G. Bandini, M. Sarotto. Proc. of **NUTHOS-11**, 11th Internat. Topical Meeting on Nuclear Reactor Thermal Hydraulics, Operation and Safety, October 9-13, 2016, Gyeongju (Korea).

P054) **Shielding and activation calculations around the reactor core for the MYRRHA ADS design**
A. Ferrari, S. Mueller, J. Konheiser, D. Castelliti, M. Sarotto, A. Stankovskiy. Proc. of **ICRS-13 & RPSD-2016**, 13th International Conference on Radiation Shielding (ICRS-13) and 19th Topical Meeting of the Radiation Protection & Shielding Division of *the* American Nuclear Society (RPSD-2016), October 3-6, 2016, Paris (France). Also published in **European Physical Journal Web of Conferences** Vol. 153, 05001, September 2017 (ISSN 2100-014X; https://doi.org/10.1051/epjconf/201715305001).

P053) **Analyses of C/E results of fission rate ratio measurements in several fast lead VENUS-F cores**
A. Kochetkov, A. Krása, P. Baeten, G. Vittiglio, J. Wagemans, V. Bécares, A. G. Bianchini, V. Fabrizio, M. Carta, G. Firpo, E. Fridman, M. Sarotto. Proc. of **ND2016**, Int. Conf. on Nuclear Data for Science and Technology, September 11-16, 2016, Bruges (Belgium). Also published in **European Physical Journal Web of Conference** Vol. 146, 06007, September 2017 (ISSN 2100-014X; https://doi.org/10.1051/epjconf/201714606007).

P052) **Spectrum Index and Minor Actinide fission rate measurements in several fast lead critical cores in the zero power VENUS-F reactor**
A. Kochetkov, A. Krása, G. Vittiglio, J. Wagemans, A. G. Bianchini, V. Fabrizio, M. Carta, G. Firpo, E. Fridman, M. Sarotto, V. Bécares.
Proc. of **PHYSOR 2016**, Int. Meeting Physics of Reactors 2016: Unifying Theory and Experiments in the 21st Century, Vol. 1, pg. 193202, May 1-5, 2016, Sun Valley (Idaho, USA).

P051) **Shielding and activation calculations for the FASTEF-MYRRHA ADS design in the subcritical operation mode**
A. Ferrari, S. Di Maria, M. Sarotto, A. Stankovskiy. Proc. of **2013 ANS Winter Meeting**, Session "**Best of ICRS/RSPD 2012**" (invited), November 10-14, 2013, Washington, DC (USA). Also published in **Journal Transactions of the American Nuclear Society**, Vol. 109, Issue Part 2, pg. 1249-1251, 2013 (ISSN 0003-018X).

P050) **Aspects of the core shielding assessment for the FASTEF-MYRRHA design**
A. Ferrari, S. Di Maria, R. Fernandez, J. Konheiser, M. Ottolini, M. Sarotto, A. Stankovskiy. Proc. of **IAEA FR13**, Int. Conf. on Fast Reactors and Related Fuel Cycles: Safe Technologies and Sustainable Scenarios, March 04-07, 2013, Paris (F).

P049) **The MYRRHA-FASTEF cores design for critical and sub-critical operational modes (EU FP7 CDT project)**

M. Sarotto, D. Castelliti, R. Fernandez, D. Lamberts, E. Malambu, A. Stanlovskiy, W. Jaeger, M. Ottolini, F. Martin-Fuertes, L. Sabathé, L. Mansani, P. Baeten. Elsevier Journal **Nuclear Engineering and Design** Vol. 265, pg. 184-200, December 2013 (ISSN 0029-5493; https://doi.org/10.1016/j.nucengdes.2013.08.055).

P048) **CIEMAT contribution to the MYRRHA neutronic design**

M. V. Vàsquez, F. Martin-Fuertes, F. Alvarez-Velarde, P. Baeten, R. Fernandez, M.Sarotto. Proc. of **ICENES 2013**, 16th Int. Conf. on Emerging Nuclear Energy Systems, Polytechnic University of Madrid, May 26-30, 2013, Madrid (Spain).

P047) **Neutronic characterization and decay heat calculations in the in-vessel fuel storage facilities for MYRRHA-FASTEF**

S. Di Maria, M. Ottolini, E. Malambu Mbala, M. Sarotto, D. Castelliti. Elsevier **Journal Energy Conversion and Management** Vol. 64, pg. 522-529, 2012 (ISSN 0196-8904; https://doi.org/10.1016/j.enconman.2012.05.001).

P046) **The Fast-spectrum Transmutation Experimental Facility FASTEF: Main Design Achievements (Part 1: Core & Primary**

System) within the FP7-CDT Collaborative Project of the European Commission

D. De Bruyn, R. Fernandez, L. Mansani, A. Woaye-Hune, M. Sarotto, E. Bubelis. Proc. of **ICAPP '12**, Int. Conf. on the Advances in Nuclear Power Plans, Vol. 2, pg. 1122-1130, June 24-28, 2012, Chicago (USA) (ISBN: 978-0-89448-091-1).

P045) **Neutronic assessment and criticality analysis of the in-vessel fuel storage facilities in the CDT/FASTEF reactor design project**

S. Di Maria, M. Ottolini, M. Sarotto, F. Martin-Fuertes, M. Vazquez, E. Malambu Mbala, P. Teles, P. Vaz, M. Reale, L. Mansani, P. Baeten. Proc. of. **ICENES 2011**, 15th Int. Conf. on Emerging Nuclear Energy Systems, May 15-19, 2011, San Francisco (USA). Also published in **Journal Transactions of Fusion Science and Technology** Vol. 61(1 T), pg. 298-301, January 2012 (ISSN 15361055; https://doi.org/10.13182/FST12-A13436).

P044) **Nuclear data sensitivity/uncertainty analysis for XT-ADS**

T. Sugawara, M. Sarotto, A. Stankovskiy, G. Van den Eynde. Elsevier Journal **Annals of Nuclear Energy** Vol 39, pg. 1098-1108, January 2011 (ISSN 0306-4549, https://doi.org/10.1016/j.anucene.2010.12.018).

P043) **Impact of nuclear data uncertainties on neutronics parameters of MYRRHA/XT-ADS**

T. Sugawara, M. Sarotto, A. Stankovskiy, G. Van den Eynde. Proc. of **NEMEA-6**, Scientific Workshop on Nuclear Measurements, Evaluations and Applications, October 25-28, 2010, Krakow (Poland). Also published in **OECD report NEA**/NSC/DOC(2011)4, pg. 2735 (https://www.oecd-nea.org/science/docs/2011/nsc-doc2011-4.pdf).

P042) **Design Features of the IRIS Reactor to reduce collective dose during operation & maintenance and to simplify D&D**

B. Petrovic, K.W. Burn, M. Ciotti, L. Casalini, M. Sarotto, F. Franceschini, M. Carelli, J. Sejvar, J. Johnson, C. Lombardi, J. McKillop, D. Hartmangruber. Proc. of the 8th Int. Conf. on **Nuclear Option in Countries with small and medium electricity grids**, May 16-20, 2010, Dubrovnik (Croatia).

P041) **European Lead-cooled SYstem core design: an approach towards sustainability**

C. Artioli, G. Grasso, E. Malambu, S. Monti, M. Sarotto. Proc. of **IAEA FR09**, Int. Conf. on Fast Reactors and Related Fuel Cycles: Challenges and Opportunities, December 7-11, 2009, Kyoto (Japan).

P040) **EFIT fuel cycle analysis with the EQL3D procedure**

J. Krepel, M. Sarotto, K. Mikityuk, C. Artioli. Proc. of **ICAPP '09**, International Congress on Advances in Nuclear Power Plants, Vol. 3, pg. 1996-2004, May 10-14, 2009, Tokyo (Japan).

P039) **ELSY Neutronic Analysis by deterministic and Monte Carlo methods: an innovative concept for the control rod systems** C. Artioli, G. Grasso, M. Sarotto, J. Krepel. Proc. of **ICAPP '09**, International Congress on Advances in Nuclear Power Plants, Vol. 1, pg. 718-725, May 10-14, 2009, Tokyo (Japan).

P038) **Deterministic and stochastic approach for a void reactivity effect evaluation: application to a Generation IV LFR** S. Bortot, R. Ghazy, M. E. Ricotti, C. Artioli, V. Peluso, M. Sarotto. Proc. of **M & C 2009**, American Nuclear Society Int. Conf. on Mathematics, Computational Methods & Reactor Physics, Vol. 4, pg. 2779-2798, May 3-7, 2009, Saratoga Springs (USA).

P037) **Neutronic and Thermal Hydraulic Analyses of ELSY nuclear reactor core**

L. Chandra, F. Roelofs, C. Artioli, M. Sarotto, G. Grasso. Proc. of **HeLiMeRT**, 5th Ed. Int. Workshop on Materials for Heavy Liquid Metal Cooled Reactors and Related Technologies, April 20-22, 2009, SCK-CEN, Mol (Belgium).

P036) **Design, Safety and Fuel Developments for the EFIT Accelerator Driven System with CERCER and CERMET cores**

W. Maschek, C. Artioli, X. Chen, F. Delage, A. Fernande-Carrettero, M. Flad, A. Fokau, F. Gabrielli, G. Glinatsis, P. Liu, L. Mansani, C.
Matzerath Boccaccini, C. Petrovich, A. Rineiski, M. Sarotto, M. Schikorr, V. Sobolev, J. Wallenius, S. Wang. Proc. of **10IEMPT**, 10th Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation, pg. 387-399, October 6-10, 2008, Mito (Japan). Also published in **OECD NEA report** no. 6420 (ISBN 978-92-64-99097-5).

P035) **Minor Actinides Transmutation in ADS: the EFIT core design**

C. Artioli, X. Chen, F. Gabrielli, G. Glinatsis, P. Liu, W. Maschek, C. Petrovich, A. Rineiski, M. Sarotto, M. Schikorr. Proc. of **PHYSOR 2008**, Int. Conf. on the Physics of Reactors "Nuclear Power: A Sustainable Resource", Vol. 3, pg. 2101-2109, September 14-19, 2008, Interlaken (Switzerland).

P034) **Reactivity coefficients and uncertainty evaluations on the EFIT core neutron design**
G. Glinatsis, C. Artioli, C. Petrovich, M. Sarotto. Proc. of **PHYSOR 2008**, Int. Conf. on the Physics of Reactors "Nuclear Power: A Sustainable Resource", Vol. 2, pg. 1135-1142, September 14-19, 2008, Interlaken (Switzerland).

P033) **Minor Actinides Transmutation in the EFIT reactor: a Design Challenge**
C. Artioli, H. Aït Abderrahim, G. Glinatsis, L. Mansani, C. Petrovich, M. Sarotto, M. Schikorr. Proc. of **NUCLEAR 2008**, Annual Int. Conf. on Sustainable Development through Nuclear Research and Education, May 28-30, 2008, Pitesti (Romania).

P032) **First Safety analyses of the EFIT core design**
P. Liu, X.-N. Chen, A. Rineiski, C. Matzerath Boccaccini, W. Maschek, C. Artioli, M. Sarotto, C. Petrovich, G. Glinatsis. Proc. of **Annual Meeting on Nuclear Technology**, May 27-29, 2008, Hamburg (Germany).

P031) **ELSY: Neutronic Design Approach**
C. Artioli, M. Sarotto, E. Malambu, V. Sobolev, S. Massara, M.E. Ricotti. Proc. of **European Nuclear Conference** (European Nuclear Society), September 16 – 20, 2007, Brussels (B).

P030) **Optimisation of the Minor Actinides Transmutation in ADS: the European Facility for Industrial Transmutation EFIT-Pb**
Concept
C. Artioli, H. Aït Abderrahim, G. Glinatsis, L. Mansani, C. Petrovich, M. Sarotto, M. Schikorr. Proc. of **ACCAPP'07**, 8th Int. Topical Meeting on Nuclear Applications and Utilization of Accelerators, pg. 560-567, July 29 – August 2, 2007, Pocatello (USA).

P029) **Design of an epithermal column for BNCT based on D-D fusion neutron facility**
E. Durisi, A. Zanini, C. Manfredotti, F. Palamara, M. Sarotto, L. Visca, U. Nastasi. Elsevier Journal **Nuclear Instruments and Methods in Physics Research A** Vol.574 Issue 2, pg. 363-369, March 2007 (ISSN 0168-9002, https://doi.org/10.1016/j.nima.2007.02.080).

P028) **EFIT fuel cycle analysis by deterministic and Monte Carlo methods**
C. Artioli, S. Monti, M. Sarotto, M. Sumini, G. Grasso, L. Monti, F. Rocchi, M. Sumini, J. Ghassoun. Proc. of **PHYTRA1**, 1st Int. Conf. on Physics and Technology of Reactors and Applications, March 14-16, 2007, Marrakech (Morocco).

P027) **In phantom figures of merit for an epithermal beam produced by a D-D compact neutron generator**
E. Durisi, A. Zanini, F. Palamara, M. Sarotto, S. Custodero, U. Nastasi. Proc. of **ICNCT-12**, 12th International Congress on Neutron Capture Therapy, October 9-13, 2006, Kagawa (Japan).

P026) **An epithermal facility for treating Brain Gliomas at the TAPIRO reactor**
K.W. Burn, L. Casalini, G. Gambarini, S. Martini, M. Mazzini, E. Nava, C. Petrovich, G. Rosi, M. Sarotto, R. Tinti. Proc. of **ISNCT-11**, 11th Int. Symposium on Neutron Capture Therapy, October 11-15, 2004, Boston (USA). Also published in Elsevier Journal **Applied Radiation and Isotopes** n. 61, pg. 987-991, 2004 (ISSN 0969-8043, https://doi.org/10.1016/j.apradiso.2004.05.052).

P025) **Monte Carlo Optimization of a BNCT Facility for treating Brain Gliomas at the TAPIRO Reactor**
E.Nava, K.W.Burn, L.Casalini, C.Petrovich, G. Rosi, M.Sarotto, R.Tinti. 10th Int. Conf. on Radiation Shielding (**ICRS-10**) and 13th
Topical Meeting on Radiation Protection and Shielding (**RPS-2004**), May 9-14, 2004, Funchal (Portugal). Also published in Journal **Radiation Protection Dosimetry** Vol. 116(1-4), pg. 475-481, 2005 (ISSN 0144-8420 (print), 1742-3406 (web); https://doi.org/10.1093/rpd/nci029).

P024) **The TRADE Source Multiplication Experiments**
G. Imel, D. Naberejnev, G. Palmiotti, H. Philibert, G. Granget, L. Mandard, R. Soule, P. Fougeras, C. Jammes, J.C. Steckmeyer, M. Carta, R. Rosa, A. Grossi, S. Monti, V. Peluso, M. Sarotto. Proc. of **PHYSOR 2004**, Int. Conf. on The Physics of Fuel Cycles and Advanced Nuclear Systems: Global Developments, pg. 1381-1390, April 25-29, 2004, Chicago (Illinois / USA).

P023) **Converting the epithermal column at the TAPIRO fast reactor from an experimental facility to one for treating patients with brain gliomas**
K.W. Burn, L. Casalini, E. Nava, C. Petrovich, M. Sarotto, R. Tinti, O. Fiorani, A. Perrone, G. Rosi. Proc. of **Int. Workshop on Neutron Capture Therapy: State of the Art**, pg. 65-74, November 28, 2003, Pisa (Italy).

P022) **Study of the Neutron Collimator Design used in the TAPIRO facility for Patient Treatment with BNCT**
M. Sarotto, K.W. Burn, L. Casalini, E. Nava, C. Petrovich. Proc. of **3rd Young Members Neutron Capture Therapy Meeting**, November 29 – December 1, 2003, Pisa (Italy).

P021) **Role of the TAPIRO Fast Research Reactor in Neutron Capture Therapy in Italy. Calculations and Measurements**
G. Rosi, S. Agosteo, K.W. Burn, L. Casalini, M. Cortesi, G. Gambarini, S. Gay, E. Nava, M. Sarotto. Proc. of **Int. Conf. on Research Reactor Utilisation, Safety, Decommissioning, Fuel and Waste Management**, pg. 325-338, organised by International Atomic Energy Agency (**IAEA-CN-100/97**), November 10-14, 2003, Santiago (Chile).

P020) **Preliminary Nuclear Design Calculations for the PDS-XADS LBE-cooled core**

K.W. Burn, G. Glinatsis, E. Nava, C. Petrovich, M. Sarotto, L. Mansani. Proc. of **InWor for P&T**, Int. Workshop on Partition & Transmutation and ADS Development, October 6-8, 2003, SCK-CEN, Mol (Belgium).

P019) **First results of colorimetric material characterization study between IEN and inmetro national standardizing institutes** L.C. Alves, J.F.S. Gomes, B. Coucerio, G. Rossi, M. Sarotto,. Proc. of **18th IMEKO World Congress 2006**: Metrology for a Sustainable Development, Vol 2, pg. 1383-1386, September 17-22, 2006, Rio de Janeiro, Brazil (ISBN: 9781622766468).

P018) **Accurate Transmittance Measurement on Hollow Glass Blocks**
M. Zinzi, A. Maccari, P. Polato, G. Rossi, M. Sarotto. Proc. of Efficiency & Sustainability, **ACEEE Summer Study** on energy efficiency in buildings, American Council for an Energy-Efficient Economy, September 2000, Washington (USA).

P017) **Characterisation of scattering properties and evaluation of light transmittance of a scattering glazing unit for daylighting applications**
A. Maccari, P. Polato, G. Rossi, M. Sarotto, M. Zinzi. Proc. of **EuroSun 2000**, ISES-Europe Solar Congress, June 2000, Copenhagen (Denmark).

P016) **Characterisation of redirecting daylighting systems by goniophotometric measurements**
G. Rossi, M. Sarotto. Proc. of **EuroSun 2000**, ISES-Europe Solar Congress, June 2000, Copenhagen (Denmark).

P015) **Daylighting characterisation of surface-diffusing glazing for building applications**
A. Maccari, M. Montecchi, P. Polato, G. Rossi, M. Sarotto, M. Zinzi. Proc. of the **ICG meeting**, Glass in the new Millennium, May 2000, Amsterdam (The Nederland).

P014) **Non-destructive evaluation of spectro-photometric characteristic to monitoring and illuminating a work of art**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of 2nd **International Congress on Science and technology for the safeguard of cultural heritage in the Mediterranean Basin**, July 5-9, Paris (France).

P013) **La misurazione dell' UGR e la verifica normativa dei sistemi di illuminazione di uffici**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **Convegno Nazionale AIDI** (National meeting of the Italian Lighting Association), pg. 46-52, November 25-26, 1999, Genova (Italy).

P012) **The measurement of UGR through a CCD based detector**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **Metrologie '99**, 9th International congress, pg. 273-275, October 1999, Bordeaux (France).

P011) **A new approach to the photometric characterisation of materials and its metrological applications**
G. Rossi, M. Sarotto, P. Iacomussi, P. Soardo. Proc. of the **IMEKO XV World congress**, International Measurement Confederation, Hidetaka Imai (ed.), Vol. XI, pg. 13-18, June 1999, Osaka (Japan).

P010) **An imaging spectroradiometric system for the works of art measurements**
P. Iacomussi, G. Rossi, M. Sarotto, P. Soardo. Proc. of the **IMEKO XV World congress**, International Measurement Confederation, Hidetaka Imai (ed.), Vol. XI, pg. 39-44, June 1999, Osaka (Japan).

P009) **Extrapolation of experimental results for the determination of light transmittance of diffusing glazing**
A. Maccari, P. Polato, G. Rossi, M. Sarotto, M. Zinzi. Journal **Stazione Sperimentale del Vetro**, November - December 1998, pg. 265-270, Venezia (Italy).

P008) **Use of diffusing glazing systems to improve internal comfort in non-residential buildings**
M. Sarotto, A. D'Este, A. Maccari, P. Polato, G. Rossi, M. Zinzi. Proc. of **5th WREC**, 5th World Renewable Energy Congress, pg. 13531356, September 20-25, 1998, Firenze (Italy).

P007) **Digital measurements in photometry**
M. Sarotto, G. Rossi, P. Iacomussi, P. Soardo. Proc. of **IMEKO TC4 98**, Symposium on Development in Digital Measuring Instrumentation and 3rd Workshop on ADC Modelling and Testing, pg. 270-275, September 17-18, 1998, Napoli (Italy).

P006) **A new imaging spectroradiometric system**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **IMEKO TC4 98**, Symposium on Development in Digital Measuring Instrumentation and 3rd Workshop on ADC Modelling and Testing, pg. 276-279, September 17-18, 1998, Napoli (Italy).

P005) **Asymptotic technique in integrating sphere transmittance measurements on diffusing transparent materials**
A. Maccari, P. Polato, G. Rossi, M. Sarotto, M. Zinzi. Proc. of **EUROSUN'98**, Int. Congress on Solar Energy, 2nd ISES-Europe Solar Congress, September 14-17,1998, Portoroz, (Slovenia).

P004) **C.C.D. Matrix Detector for Photometry**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **Metrologie '97**, 8th Int. congress of Metrology, pg. 326-330, October 20-23, 1997, Besançon (France).

P003) **Computer simulation of tunnel lighting: a comparison between different procedures**
M. Sarotto, G. Rossi, P. Iacomussi, P. Soardo. Proc. of **8th Lux Europa 97**, pg. 1161-1167, May 11-14, 1997, Amsterdam (ND).

P002) **Caratterizzazione fotometrica dei materiali per via gonioriflettometrica**
G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **Convegno Nazionale AIDI** (National meeting of the Italian Lighting Association), pg. 35-42, October 24-25, 1996, Sanremo (Italy).

P001) **Misurazioni gonioriflettometriche per la colorimetria**

G. Rossi, P. Iacomussi, M. Sarotto, P. Soardo. Proc. of **Convegno Nazionale SIOF** (National meeting of the Italian Society for Optics and Photonics), June 1996, Varese (IT). Also published in Journal **Laboratorio 2000**, August-Sept. 1997, pg. 97-101.

2.2) Rapporti tecnici ENEA (E01-76; inclusi deliverables per progetti EURATOM ed IAEA reports)

E076) **The "A-BAQUS" for ADS core design: Application to LEU ADSs**
G. Grasso, M. Sarotto, F. Lodi, R. Pergreffi, D.M. Castelluccio, D. Giusti. Contribution to "Accelerator Driven System (ADS): Applications and Use of Low Enriched Uranium in ADSs: Results of a Coordinated Research Project", **IAEA TECDOC** under preparation.

E075) **MCNP analyses of the 100 kV D-ion-based compact neutron source: irradiation performances for nIORT® treatments with different irradiation window diameters**
M. Sarotto, M. Martellini (UnIsubria). Technical Report ENEA SICNUC-P000-045, January 2022 (LINCER project, ENEATheranostiCentre Srl agreement).

E074) **Neutronic Analyses of the BFS Experiments for an "LFR Oriented" Adjustment of Nuclear Data Libraries**
M. Sarotto, F. Lodi, D. M. Castelluccio, G. Grasso, V. Peluso. **ENEA annual report** High Performance Computing on **CRESCO** infrastructure: research activities and results 2020, December 2021 (ISBN: 978-88-8286-429-3).

E073) **Parametric MCNP analyses to address the design of a neutron collimator for high-flux compact DD sources to be used in cancer radiotherapy**
M. Sarotto. Technical Report ENEA SICNUC-P000-044, December 2021 (LINCER project, ENEA-TheranostiCentre Srl agreement).

E072) **Neutronic analyses of the ALFRED LEADER core by deterministic (ERANOS) and Monte Carlo (Serpent) codes with JEFF-3.1 and END/F-B-VIII.0 libraries: comparison between flux and power spatial distributions in BoC/EoC nominal conditions** M. Sarotto, N. Abrate (PoliTO). Technical Report ENEA SICNUC-P000-043, December 2021.

E071) **Neutronic analyses of the ALFRED LEADER core with deterministic (ECCO / ERANOS) and Monte Carlo (Serpent) codes:**
comparison between macroscopic-group constants, shutdown systems worth and spatial-angular flux distributions M. Sarotto, N. Abrate (PoliTO). Technical Report ENEA SICNUC-P000-037, February 2021.

E070) **Core design for the UN-fueled version of the Westinghouse Commercial Lead Fast Reactor (CLFR)**
F. Lodi, G. Grasso, M. Sarotto. Technical Report ENEA SICNUC-P000-032 rev. 1, April 2020 (Westinghouse Purchase order n. 4500771039 - 28 March 2019).

E069) **Core design for the UOX-fueled version of the Westinghouse Prototype Lead Fast Reactor (PLFR)**
M. Sarotto, G. Grasso, F. Lodi. Technical Report ENEA SICNUC-P000-031 rev. 1, April 2020 (Westinghouse Purchase order n. 4500771039 - 28 March 2019).

E068) **Core design for the UOX-fueled version of the Westinghouse Commercial Lead Fast Reactor (CLFR)**
M. Sarotto, G. Grasso, F. Lodi. Technical Report ENEA SICNUC-P000-030 rev. 1, April 2020 (Westinghouse Purchase order n. 4500771039 - 28 March 2019).

E067) **Workshop Tematico Accordo di Programma ENEA- MiSE PAR2017, Progetto B.3.1 LP2, LFR-GEN IV Stato attuale della tecnologia e prospettive di sviluppo**
D. Martelli *et. al.*. **Deliverable AdP ENEA-MiSE PAR 2017** (Workshop in "La Sapienza" University, Rome, 14-15 June 2018), Technical Report ENEA ADPFISS-LP2-166, pg. 749-770, December 2018.

E066) **Results of the MYRRHA mock-up reactivity effects from reflector and IPS introduction in the VENUS-F reactor and detector position optimization**
J.L. Lecouey, V. Bécares,A. Kochetkov, A. Krása, A. Billebaud, M. Sarotto, P. Baeten, S. Chabod, T. Chevret, F.r: Lecolley, G. Lehaut, N. Marie, N. Messaoudi, D. Villamarin, G. Vittiglio, J. Wagemans. **Deliverable 5.2 H2020 (Horizon 2020) MYRTE project** (Technical Report SCK•CEN/28278636), March 2018.

E065) **Validation campaign of neutronic codes for LFR systems on CRESCO HPC**
M. Sarotto, G. Grasso. **ENEA annual report** High Performance Computing on **CRESCO** infrastructure: research activities and results 2017 (ISBN: 978-88-8286-373-9), pg. 133-136, December 2017.

E064) **Workshop Tematico Accordo di Programma ENEA-MiSE PAR2016, Progetto B.3.1 LP2, LFR-GEN IV Stato attuale della tecnologia e prospettive di sviluppo**
D. Martelli et. al., **Deliverable AdP ENEA-MiSE PAR 2016** (Workshop in Bologna University, 26-27 September 2017), Technical Report ENEA ADPFISS-LP2-154), December 2017.

E063) **Results of the validation campaign of neutronic codes and recommendations for the correct application to LFR systems** G. Grasso, M. Sarotto, P. Console Camprini. **Deliverable AdP ENEA-MiSE PAR 2016**, Technical Report ENEA ADPFISS-LP2-141, November 2017.

E062) **Preliminary neutronic analyses of the MYRTE-CC11 core results with the ERANOS code**
M. Sarotto, V. Fabrizio, M. Carta. Technical Report ENEA SICNUC-P000-020, November 2017.
Presented at **EURATOM H2020 MYRTE WP5 Second Technical meeting**, 26 October 2017, Brussels (B).

E061) **Preliminary neutronic analyses of the CC10 core experimental results with the ERANOS code** M. Sarotto, V. Fabrizio, M. Carta. Technical Report ENEA SICNUC-P000-019*,* November 2017*.*
Presented at **EURATOM H2020 MYRTE WP5 First Technical meeting**, April 26, 2017, Brussels (B).

E060) **The steady state neutronic modelling of the ALFRED core by the ERANOS deterministic code with an in-depth study on shutdown systems design bases and performances**
M. Sarotto, G. Grasso, F. Lodi. Technical Report ENEA SICNUC-P000-018 (**FALCON** consortium)*,* November 2017*.*

E059) **The current ALFRED core design**
G. Grasso, F. Lodi, M. Sarotto. Technical Report ENEA SICNUC-P000-017 (**FALCON** consortium)*,* November 2017*.*

E058) **Results of measurements in the MYRRHA mock-up reference critical core, chosen during Task 5.1 (v1)**
A. Kochetkov, A. Krása, N. Messaoudi, M. Sarotto, V. Fabrizio, M. Marchetti, F. Gabrielli, A. Rineiski. **Deliberable 5.1 EURATOM H2020 MYRTE** project (Technical Report SCK•CEN/24477244), September 2017*.*

E057) **Procedure for pin-by-pin reconstruction of an ERANOS flux (power) in a Fuel Assembly** G. Grasso, F. Lodi, M. Sarotto. Technical Report ENEA SICNUC-P000-008*,* November 2016*.*

E056) **The core design of Gen-IV Lead Fast Reactors using the ERANOS code on the CRESCO HPC infrastructure**
M. Sarotto, G. Grasso, F. Lodi. **ENEA annual report** High Performance Computing on **CRESCO** infrastructure: research activities and results 2015 (ISBN: 978-88-8286-342-5), pg. 155-158, November 2016*.*

E055) **Results of the validation campaign of neutronic codes and recommendations for the correct application to LFR systems** M. Sarotto, G. Grasso. **Deliverable AdP ENEA-MiSE PAR 2015** (Technical Report ENEA ADPFISS-LP2-115)*,* September 2016*.*

E054) **Tridimensional analysis of local perturbations on the ALFRED core reactivity and the thermal-hydraulics of the fuel elements** M. Sarotto, G. Grasso, F. Lodi, G. Bandini, M. Sumini. **Deliverable AdP ENEA-MiSE PAR 2015** (Technical Report ENEA ADPFISSLP2-113)*,* September 2016*.*

E053) **Lab session content**
V. Arzhanov, A. Kochetkov, M. Baylac, S. Bortot, A. Krása, E. Fridman, J.-L. Lecouey, J. Martinez-Val, M. Sarotto, S. Chabod, M. Szieberth, W. Uyttenhove, D. Villamarín**. Deliverable D5.1 EURATOM FP7 FREYA** project (Technical Report SCK•CEN A000FREYA/AK/A000FREYA-05-0067), March 2016*.*

E052) **The VENUS-F CC6 core: ERANOS neutronic analyses and comparison with experimental data** M. Sarotto. Technical Report ENEA FSN-SICNUC-004*,* March 2016*.*
Presented at **EURATOM FP7 FREYA WP3/4 meeting**, November 12-13, 2015, Genova (Italy).

E051) **LFR mock-up reactivity effects**
M. Sarotto, G. Firpo, A. Kochetkov, A. Krása, G. Vittiglio, J. Wagemans, E. Fridman, J. Cetnar, G. Domanska, V. Fabrizio. **Deliverable D4.3 EURATOM FP7 FREYA** project (Technical Report ENEA FSN-SICNUC-003), December 2015.

E050) **LFR mock-up characterisation**
A. Kochetkov, A. Krása, G. Vittiglio, J. Wagemans, G.Firpo, V. Fabrizio, M. Sarotto. **Deliverable D4.2 EURATOM FP7 FREYA** project (Technical Report SCK-CEN A000FREYA/AK/A000FREYA-04/15/0059), October 2015*.*

E049) **LFR mock-up definition**
M. Sarotto, G. Firpo, A. Kochetkov, A. Krása, G. Vittiglio, J. Wagemans, V. Fabrizio. **Deliverable D4.1 EURATOM FP7 FREYA** project (Technical Report ENEA FSN-SICNUC-002), October 2015.

E048) **Information to support the LFR ALFRED FA/core definition on VENUS: preliminary spectra analyses (with the ERANOS deterministic code)**
M. Sarotto. Technical Report ENEA FSN-SICNUC-P9US-001*,* October 2015*.* Presented at **EURATOM FP7 FREYA meeting**, January 27, 2015, Brussels (B).

E047) **Possible working range of the MYRRHA core and basic neutronic parameters for safety analyses**
M. Sarotto. **Deliverable D2.1 EURATOM FP7 MAXSIMA** project (Technical Report ENEA UTFISSM - P9B2 – 004)*,* September 2014.

E046) **Neutronic analysis of maximum cores with the ERANOS deterministic code (and JEFF3.1 nuclear data library)**
M. Sarotto. Technical Report ENEA UTFISSM - P9B2 – 003*,* May 2014. Presented at **EURATOM FP7 SEARCH-MAXSIMA meeting**, April 28-30, 2014, Ghent (B).

E045) **Neutronic analysis of minimum cores and first investigation on maximum cores with ERANOS deterministic code** M. Sarotto. Technical Report ENEA UTFISSM - P9B2 – 002*,* December 2013.
Presented at **EURATOM FP7 SEARCH-MAXSIMA meeting**, November 28-29, 2013, Rhode-Saint-Genèse (B).

E044) **Preliminary neutronic analysis of minimum critical and sub-critical cores (ERANOS deterministic code)** M. Sarotto. Technical Report ENEA UTFISSM - P9B2 – 001, December 2013.
Presented at **EURATOM FP7 SEARCH-MAXSIMA meeting**, May 7-8, 2013, Pula (Italy).

E043) **FASTEF design changes to operate in critical mode**
M. Sarotto, R. Fernandez, E. Malarnbu, A Stankovskiy, E. Bubelis, R. Oaqan, W. Jaeqer, A Travleev, M. Becker, F. Martin-Fuertes, M. Vazquez, F. Àlvarez Velarde, A Ferrari, S. Di Maria, L. Sabathe, M. Ottolini. **Deliverable D2.2 EURATOM FP7 CDT** project (Technical Report ENEA UTFISSM - P9P0 - 020 rev. 0), September 2012.

E042) **A possible solution for the MYRRHA-FASTEF critical core with the 30 wt. % Pu mass content: the increasing of fissile length** M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 022, July 2012 (**EURATOM FP7 CDT** project).

E041) **Proposed methodology for shielding/activation evaluations in critical and sub-critical MYRRHA-FASTEF equilibrium configurations**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 019, February 2012.
Presented at **EURATOM FP7 CDT WP2 meeting**, January 18-20, 2012, Mol (B).

E040) **MYRRHA-FASTEF sub-critical core (30 wt. % E_{Pu}): Reactivity coefficients (ERANOS/JEFF3.1) and allowed level of subcriticality at BoL. Last proposals for the T2.2/D2.2 work plan.**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 018, February 2012.
Presented at **EURATOM FP7 CDT WP2 meeting**, January 18-20, 2012, Mol (B).

E039) **MYRRHA-FASTEF sub-critical core (30 wt. % E_{Pu}): Temperature feedback effects, main reactivity (& power) coefficients at BoL**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 017, February 2012 (**EURATOM FP7 CDT** project).

E038) **MYRRHA-FASTEF sub-critical core (30 wt. % E_{Pu}): chosen approach and preliminary ERANOS results. Some proposals for the T2.2/D2.2 work plan.**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 016, February 2012.
Presented at **EURATOM FP7 CDT WP2 meeting**, October 10-14, 2011, Mol (B).

E037) **Critical core design of MYRRHA/FASTEF: main reactivity coefficients at BoL, BoC and BoC** M. Sarotto, Technical Report ENEA UTFISSM - P9P0 – 012, July 2011.
Non-Contractual Report **EURATOM FP7 CDT** project **REP008-2011**, September 2011.

E036) **Critical core design of MYRRHA/FASTEF: refinement of shutdown systems and neutronic characterisation of the equilibrium sub-cycle core**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 011, July 2011.
Non-Contractual Report **EURATOM FP7 CDT** project **REP007-2011**, September 2011.

E035) **MYRRHA-FASTEF critical core: review of preliminary neutronic calculations in CDT at the beginning of WP2**
A. Travleev, M. Sarotto, F. Martin-Fuertes, M. Vazquez, F. Alvarez. Non-Contractual Report **EURATOM FP7 CDT** project **REP0092011**, June 2011.

E034) **First approach/proposal for the MYRRHA-FASTEF sub-critical core by the 30 wt.% Pu mass content** M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 015, July 2011 (**EURATOM FP7 CDT** project).

E033) **The "complete" neutronic characterisation of the FASTEF critical core by ERANOS/JEFF3.1. Some proposals for Task 2.2: a possible approach for the sub-critical mode**
M. Sarotto, Technical Report ENEA UTFISSM - P9P0 – 014, July 2011.
Presented at **EURATOM FP7 CDT WP2 meeting**, June 23-27, 2011, Mol (B).

E032) **Scoping neutronic investigations for MYRRHA critical (and sub-critical) core**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 013, July 2011 (**EURATOM FP7 CDT** project).

E031) **The current frozen design of the FASTEF critical core (151 SA): ERANOS model based on mechanical drawings (& referred to MCNPX). Some proposals for T2.2/D2.2: definition and simulation of the equilibrium sub-cycle core** M. Sarotto, Technical Report ENEA UTFISSM - P9P0 – 010, July 2011.
Presented at **EURATOM FP7 CDT WP2 meeting**, January 19-21, 2011, SCK-CEN HQ, Brussels (B).

E030) **The ERANOS model (based on mechanical drawings) of the current frozen MYRRHA-FASTEF critical core** M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 009, July 2011.
Presented at **EURATOM FP7 CDT WP2/T2.2 meeting**, January 18, 2011, SCK-CEN HQ, Brussels (B).

E029) **The MYRRHA-FASTEF critical core: neutronic estimations at BoL with the ERANOS deterministic code** M. Sarotto, Technical Report ENEA UTFISSM - P9P0 – 008, November 2010.
Presented at **EURATOM FP7 CDT WP2 meeting**, October 14-15, 2010, SCK-CEN HQ, Brussels (B).

E028) **Analysis of MYRRHA-FASTEF to operate in a critical mode**
M. Sarotto. **Deliverable D1.2 EURATOM FP7 CDT** (Technical Report ENEA UTFISSM - P9P0 - 001 rev.0), November 2010.

E027) **Preliminary FA / core design for MYRRHA/FASTEF**

M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 007, July 2010.
Non-Contractual Report **EURATOM FP7 CDT** project **REP003-2010**, July 2010.

E026) **XT-ADS sensitivity analysis**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 006, July 2010 (based on **EURATOM FP5 PDS-XADS** project). Collection of two SCK-CEN Calculation Notes ANS/RMS/TS/ARTD00CDT-02/827/10-15 (-16), June 2010, Mol (B).

E025) **Pre-frozen FA and critical core for FASTEF**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 005, July 2010.Presented at **EURATOM FP7 CDT WP2 meeting**, June 22-23, 2010, Mol (B).

E024) **Critical core solutions for FASTEF (with hollow and solid pellets)**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 004, July 2010.
Presented at **EURATOM FP7 CDT WP2 meeting**, April 27-28, 2010, Mol (Belgium).

E023) **CDT/FASTEF Task 1.2 state of the art at the end of WP1**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 003, July 2010.
Presented at **EURATOM FP7 CDT WP2 kick off meeting**, March 9-10, 2010, SCK-CEN HQ, Brussels (B).

E022) **Analysis of MYRRHA-FASTEF to operate in a critical mode: first sketches for the critical layout (199 S/As) and main "high flux task" decisions**
M. Sarotto. Technical Report ENEA UTFISSM - P9P0 – 002, July 2010.
Presented at **EURATOM FP7 CDT WP1 meeting**, November 23-25, 2009, Brussels (B).

E021) **Preliminary neutronic and thermal-hydraulic analyses of a fast (LBE cooled) experimental reactor/irradiation facility** M. Sarotto. Technical Report ENEA FISNUC-P9P0-001 rev. 0, January 2010, Thesis of **Master (II level) in Nuclear Engineering** "Progettazione e gestione di sistemi nucleari avanzati", University of Bologna (UniBO), A.A. 2008-2009.

E020) **ELSY core design static, dynamic and safety parameters with the open square FA**
M. Sarotto, C. Artioli, G. Grasso. **Deliverable D8 EURATOM FP6 ELSY** project DEL/09/008 (Technical Report ENEA FPN P9IX 006 rev. 0), November 2009.

E019) **Deterministic calculations for the IRIS reactor**
M. Ciotti, M. Sarotto, R. Orsi. Technical Report ENEA FPN P9LU 039 rev. 0, July 2009 (**AdP ENEA-MiSE**).

E018) **EFIT Core Design Summary Report**
G. Glinatsis, C. Artioli, R. Calabrese, C. Petrovich, M. Sarotto, M. Schikorr, T. Vereshchagina. **Deliverable D1.x34 EURATOM FP6 IP EUROTRANS** project (Technical Report ENEA FPN P9EH 016), January 2009.

E017) **ELSY Open square Fuel Assembly Design and Drawings**
M. Sarotto, C. Artioli, S. *Massara*, G. Grasso, D. Gugiu, V. Hristea, M. Reale. **Deliverable D6 EURATOM FP6 ELSY** project (Technical Report ENEA FPN P9IX 004), November 2008.

E016) **ELSY Neutronic Analysis: Status of the Open square Design**
M. Sarotto, C. Artioli, G. Grasso. Technical Report ENEA FPN P9IX 005 rev. 0, December 2008. Presented at **the EURATOM FP6 ELSY WP2 Meeting**, September 24, 2008, Genova (I).

E015) **Specification for the EFIT Core and Fuel Element**
M. Sarotto, C. Artioli, C. Petrovich, G. Glinatsis. **Deliverable D1.6 EURATOM FP6 IP EUROTRANS** project (Technical Report ENEA FPN P9EH 011 rev. 0), June 2008.

E014) **EFIT Core Reference Cycle Analysis and Reactivity Coefficients**
C. Artioli, G. Glinatsis, C. Petrovich, M. Sarotto. **Deliverable D1.36 EURATOM FP6 IP EUROTRANS** project (Technical Report ENEA FPN P9EH 015 rev. 0), June 2008.

E013) **IRIS Preliminary Shielding Analysis of the Vessel by deterministic methods** M. Sarotto. Technical Report ENEA FPN P9LU 003 rev. 0, May 2007.
Presented at **IRIS 19th Team Meeting**, May 7-9, 2008, Georgia University, Atlanta (USA).

E012) **Preliminary Neutronic Analysis of the three zones EFIT-MgO/Pb Core**
M. Sarotto, C. Artioli, V. Peluso. Technical Report ENEA FPN P9EH 002 rev. 0, April 2007 (**EURATOM FP6 IP EUROTRANS** project).

E011) **Possible solutions for the Neutronic Design of the two zones EFIT-MgO/Pb Core**
M. Sarotto, C. Artioli. Technical Report ENEA FPN P9EH 001 rev. 0, April 2007 (**EURATOM FP6 IP EUROTRANS** project).

E010) **EFIT-MgO/Pb Core Neutronic Preliminary Analysis**
M. Sarotto, C. Artioli. Technical Report ENEA FIS P815 021 rev. 0, April 2006 (**EURATOM FP6 IP EUROTRANS** project).

E009) **Preliminary Evaluation of the ETD / EFIT neutronic performances with deterministic methods**
M. Sarotto, C. Artioli, V. Peluso. Technical Report ENEA FIS P815 016 rev. 0, October 2005 (**EURATOM FP6 IP EUROTRANS** project).

E008) **Comparison between Cross-section data for deterministic and Monte Carlo calculations in the TRADE experiment** M. Sarotto, V. Peluso, M. Carta. Technical Report ENEA FIS P99R 004 rev. 1, April 2005 (**ENEA TRADE** project).

E007**) Evaluation of Multi-Temperature Cross Sections for deterministic calculations in the TRADE experiment** M. Sarotto, V. Peluso. Technical Report ENEA FIS P99R 001 rev. 0, October 2004 **(ENEA TRADE** project**).**

E006) **Sintesi della prima fase dell'attività TOY (Transmutation Optimization Yield)** C. Artioli, S. Cevolani, G. Glinatsis, M. Sarotto. Technical Report ENEA FIS P894 007 rev. 0, April 2004.

E005) **Geometrical design of the neutron reflector-collimator used in the TAPIRO facility to treat brain gliomas by the BNCT technique** M. Sarotto. Technical Report ENEA FIS P129 003 rev. 0, February 2004 (**ENEA NUME** project).

E004) **PDS-XADS Fuel Cycle Analysis by means of deterministic methods** M. Sarotto, V. Peluso. Technical Report ENEA FIS P895 021 rev. 0, December 2003. Appendix of **Deliverable DEL/04/049 EURATOM FP5 PDS-XADS WP4.1** (CORE REFERENCE CYCLE ANALYSIS FOR THE LBE-COOLED XADS, FIKW-CT-2001-00179), ENEA FIS P895 027 rev. 1, February 2005.

E003) **Evaluation of the PDS-XADS reactivity level at Beginning of Cycle by means of deterministic methods** M. Sarotto, V. Peluso. Technical Report ENEA FIS P895 014 rev. 1, September 2003.

E002) **The impact of different cell calculation methodologies on the ADS-DF reactivity level** M. Sarotto, V. Peluso. Technical Report ENEA FIS P894 004 rev 0, July 2003 (**ENEA-ANSALDO ADS-DF** project).

E001) **A parabolic collimator as a possible solution in the TAPIRO epithermal column used for Patient Treatment with BNCT** M. Sarotto. Technical Report ENEA FIS P129 002, March 2003. Inserted in the **2003 ENEA Annual Report for MIUR**.

2.3) Rapporti Tecnici IEN (I01-04; ora INRIM, Torino)

I04) **A system to measure the photometric behaviour of materials: analysis of the full oriented CCD multi-luminancemeter** M. Sarotto, G. Rossi., Technical Report IEN Galileo Ferraris, RT n. 606, May 2000.

I03) **Non-linear approximation of diffusing material measured transmittance** M. Sarotto, G. Rossi. Technical Report IEN Galileo Ferraris, RT n. 605, May 2000.

I02) **Simulazioni al calcolatore del comportamento in riflessione dei materiali da rivestimento e loro applicazione nel calcolo dell'illuminamento in galleria stradale** M. Sarotto, G. Rossi, P. Soardo. Technical Report IEN Galileo Ferraris, RT n. 527, May 1997.

I01) **Metodo di misurazione del fattore di luminanza per applicazioni nel calcolo illuminotecnico di gallerie stradali** G. Rossi, M. Sarotto. Technical Report IEN Galileo Ferraris, RT n. 518, June 1996.

2.4) Altre presentazioni a meeting, workshop e gruppi di lavoro internazionali (W01-22)

W22) **The "A-BAQUS" for ADS core design: Application to LEU ADSs** G. Grasso, M. Sarotto, F. Lodi, R. Pergreffi, D.M. Castelluccio, D. Giusti. **IAEA CRP ADS Applications and Use of Low-Enriched Uranium in ADSs**, Final Meeting, December 10-14, 2018, Budapest (Hungary).

W21) **LFR core design: Performances and Potentiality** M. Sarotto, G. Grasso. **INEST** (Institute of Nuclear Energy Safety Technology) **-ENEA Bilateral meeting** on nuclear technologies development: status synergies and future perspective, November 7-10, 2016, INEST Headquarters, Hefei (China).

W20) **Tridimensional analysis of local perturbations on the ALFRED core** M. Sarotto, G, Grasso, F. Lodi. **AdP ENEA-MiSE - PAR 2015 Progress Meeting**, June 24, 2016, ENEA Bologna (Italy).

W19) **Validation campaign of neutronic codes and recommendations for the correct application to LFR systems** M. Sarotto, G, Grasso. **AdP ENEA-MiSE - PAR 2015 Progress Meeting**, June 24, 2016, ENEA Bologna (Italy).

W18) **Activation calculations for the MYRRHA accelerator-driven system design** D. Castelliti, A. Ferrari, J. Konheiser, S. Muller, M. Sarotto, A. Stankovskiy. **ARIA'15**, **3rd International Workshop** on Accelerator Radiation Induced Activation, April 15-17, 2015, Knoxwille (Tennessee, USA).

W17) **MYRRHA current design and design changes** P. Leysen, R. Fernandez, L. Mansani, A. Woaye-Hune, M. Sarotto, E. Bubelis, J. Engelen, A.Ortega, M. Perezagua Aguado. **NordicGen4 Seminar**, October 29-31, 2012, Risø (Denmark).

W16) **Shielding and activations calculations for the MYRRHA ADS design in the subcritical operation mode**

A. Ferrari, S. Di Maria, M. Sarotto, A. Stankovskiy. 12th International Conference on Radiation Shielding (**ICRS-12**) & Topical Meeting on the Radiation Protection and Shielding (**RPSD-2012**), September 2-7, 2012, Nara (Japan).

W15) **Analysis of MYRRHA/FASTEF to operate in a critical mode: safety and control rod strategy in critical core** M. Sarotto. **EURATOM FP7 CDT / FASTEF WP1- Task1.2 meeting**, October 13-14, 2009, SCK-CEN HQ, Brussels (B).

W14) **Analysis of MYRRHA/FASTEF to operate in a critical mode: preliminary evaluation of S/A absorber anti-reactivity worth** M. Sarotto, C. Artioli. **EURATOM FP7 CDT / FASTEF WP1- Task1.2 meeting**, July 8-9, 2009, SCK-CEN HQ, Brussels (B).

W13) **Analysis of MYRRHA/FASTEF to operate in a critical mode: initial Brainstorming**
M. Sarotto, C. Artioli. **EURATOM FP7 CDT / FASTEF WP1- Task1.2 meeting**, June 2-3, 2009, SCK-CEN HQ, Brussels (B).

W12) **ELSY Open Square core neutronics and fuel cycle analysis**
C. Artioli, G. Glinatsis, G. Grasso, D. Gugiu, C. Petrovich, M. Sarotto. **EURATOM FP6 ELSY WP2 meeting**, February 27, 2009, SCKCEN HQ, Brussels (B).

W11) **3D Deterministic transport analysis (TORT 3.2): Last results at PV and "First" Concrete**
M. Sarotto, M. Ciotti. **IRIS – Shielding Working Group Meeting**, October 13-15, 2008, ENEA - Bologna.

W10) **Evaluation of Radiation field in the Iris Nuclear Power Plant using 3-D transport Theory Analysis**
K. W. Burn, M. Sarotto, F. Franceschini, B. Petrovic, Jeffrey Johnson, Enrico Padoani, Antonio Cammi. 11th Int. Conf. on Radiation

Shielding (**ICRS-11**) & 15th Topical Meeting on the Radiation Protection and Shielding (**RPSD-2008**), April 13-18, 2008, Callaway Gardens, GA (USA).

W09) **3D Deterministic transport analysis (TORT 3.2): First results at the Vessel**
M. Sarotto. **IRIS 19th Team Meeting – Shielding Working Group**, May 7-9, 2008, Georgia University – Atlanta (USA).

W08) **ELSY Neutronic Design: Open square option**
C. Artioli, M. Sarotto. **EURATOM FP6 ELSY WP2 meeting**, July 3, 2007, SCK-CEN HQ, Brussels (B).

W07) **Neutronic Design of the three zone EFIT-MgO/Pb core**
M. Sarotto, C. Artioli, V. Peluso, C. Petrovich. **EURATOM FP6 EUROTRANS - DM1 WP1.5 Safety meeting**, May 22-23, 2007, KTH Stockholm (SW).

W06) **Preliminary evaluations about the ELSY Neutronic Design**
C. Artioli, M. Sarotto. **EURATOM FP6 ELSY WP2 meeting**, January 25, 2007, Paris (France).

W05) **Design of the EFIT-Mgo/Pb Core and Fuel Assemblies**
M. Sarotto, C. Artioli. **EURATOM FP6 EUROTRANS WP1.5 Safety meeting,** October 10-11, 2006, AREVA, Lyon (F).

W04) **Possible solutions for the EFIT/Mgo-Pb Core Neutronic Design**
M. Sarotto, C. Artioli. **EURATOM FP6 EUROTRANS - DM1 & DM3 Specialist meeting**, June 12-14, 2006, CEA Cadarache (F).

W03) **EFIT/Mgo-Pb Core** Neutronic **Preliminary Design**
M. Sarotto, C. Artioli, V. Peluso. **EURATOM FP6 EUROTRANS DM1 WP1.1 & WP1.2 Joint meeting,** February 8-9, 2006, ENEA, Bologna.

W02) **Preliminary Evaluation of the influence of the fuel pin diameter on the EFIT core burn up performances**
M. Sarotto, C. Artioli, V. Peluso. **EURATOM FP6 EUROTRANS - DM1 - WP1.2 - Task 1.2.4**: **1st meeting** on the lead Efit core design, July 22, 2005, ENEA, Bologna.

W01) **MSM Factors Calculations: Heterogeneous XY TRIGA Model**
V. Peluso, M. Sarotto, M. Carta. **TRADE General Progress Meeting,** January 27, 2004, CEA, Cadarache (F).

3) Appendice 3 – Partecipazione a Scuole / Corsi Internazionali (S01-05)

S05) Course on **Analytical Benchmarks: Case Studies in Neutron Transport Theory**, OECD/NEA (Nuclear Energy Agency) Headquarters, Issy-les-Moulineaux (F), January 2008.

S04) **Formation au scenario code COSI6** (Scenario Code for the sustainability of nuclear energy), CEA, Cadarache (F), July 16-20, 2007.

S03) **Modelling Advanced Nuclear Systems with the ERANOS Code**, Int. Workshop at CEA, Cadarache (F), May – June 2006.

S02) **Modern Reactor Physics and the Modelling of Complex Systems: Nuclear Waste Transmutation and Related Innovative Technologies**, Frederic Joliot / Otto Hahn Summer School in Reactor Physics, CEA, Cadarache (F), August 21-30, 2002.

S01) **Recent Advances in in Metrology and Fundamental Constants**, International School of Physics "Enrico Fermi" (CXLVI), Varenna (IT), July 25 – August 4, 2000.

4) Appendice 4 – Attività di ricerca svolta presso IEN e Politecnico di Torino (1996-2001)

Le attività svolte presso il reparto Fotometria dell'Istituto Elettrotecnico Nazionale (IEN), ora Istituto Nazionale di Ricerca

Metrologica (INRiM, Torino), sono iniziate nel febbraio 1995 con la tesi di laurea in Fisica a carattere sperimentale dal titolo: "Modellizzazione di superfici mediante misure gonio-riflettometriche". A partire dalle misure gonio-fotometriche del comportamento in riflessione dei materiali utilizzati per il rivestimento delle pareti in galleria stradale, si sono riprodotti i dati sperimentali mediante modelli fisico-matematici per simulare la ripartizione spazio-angolare della luce riflessa e valutare il loro contributo all'illuminamento sul manto stradale. Successivamente, le attività presso il reparto Fotometria sono proseguite con:

- Borsa di Addestramento alla Ricerca IEN nel periodo Novembre 1996 – Febbraio 1998. L'attività puntava a sviluppare l'utilizzazione della matrice C.C.D. (Charge Coupled Device) come rilevatore per le misure fotometriche. A differenza dei normali rilevatori, il CCD permette la valutazione delle caratteristiche di uniformità delle sorgenti luminose e dei materiali misurati in riflessione/trasmissione e/o di aumentare la risoluzione spaziale nelle misure direzionali. Si è inoltre sviluppato un nuovo generale modello pseudo-analitico per calcolare la distribuzione dell'illuminamento all'interno di un ambiente, a partire dalla distribuzione angolare dell'intensità luminosa delle sorgenti e dal comportamento in riflessione/trasmissione dei materiali presenti nell'ambiente simulato. I risultati, ottenuti con algoritmi tipo "ray tracing" e "pseudo-radiosity", sono stati confrontati in termini di accuratezza e tempo di calcolo.
- Dottorato in "Metrologia: Scienza e Tecnica delle Misure" presso il Politecnico di Torino (in collaborazione con IEN) nel periodo Febbraio 1998 - Marzo 2001. Argomento di ricerca: spettro-radiometria dei materiali e relative applicazioni illuminotecniche; titolo della tesi: "Goniophotometry of materials: measurement and applications". Nel corso delle attività si è continuata l'esplorazione delle potenzialità delle misure digitali in campo fotometrico per l'analisi superficiale dei materiali e/o per ottenere una maggiore accuratezza nelle misure direzionali. A partire dalle misurazione gonio-fotometrica del comportamento in riflessione/trasmissione dei materiali, si è sviluppato un sofisticato modello di simulazione che utilizza le trasformate 2D di Fourier per considerare gli effetti di deformazione e sfocatura (della lente del rilevatore) e, allo stesso tempo, permette di individuare un eventuale non perfetto allineamento in fase di misurazione. In ambito illuminotecnico, in collaborazione con la Stazione Sperimentale del Vetro (Venezia) e l'ENEA (ex Dipartimento Energia, Casaccia), si è misurato e simulato il comportamento dei vetri diffondenti utilizzati in edilizia per migliorare il comfort visivo negli ambienti non residenziali.

5) Appendice 5 – Additional information on the research activities in ENEA (2001-2021)

Complementary information on the activities carried out in ENEA for the two major lines of research (see a) and b) in the main part of the CV) and the main duties / responsibilities assumed are summarised in the following.

a) Core design of critical and sub-critical (*i.e.*, ADS) fast nuclear systems cooled by heavy liquid metals, as lead (*i.e.*, LFR) or Lead-Bismuth Eutectic (LBE). The consolidated expertise in the neutronic analysis, coupled with the fairly good competencies in Thermal-Hydraulics (TH), enabled to take the leadership in the core design activities carried out in some EURATOM projects. The neutronic studies were performed with both deterministic and stochastic methods, by an extensive use of the ERANOS deterministic code (CEA, France) and a good knowledge of the stochastic MCNP code (LANL, USA). He was involved in the following EURATOM projects of the 5-7th Framework Programme (FP) and Horizon 2020 (H2020) programme.
   - MYRTE (MYrrha Research and Transmutation Endeavour, H2020; April 2015 – March 2019): simulation and detailed analyses of experimental measurements of some fundamental neutronic parameters (core criticality, control rod and lead void reactivity worth, spectral indices, radial and axial traverses of fission rates, etc.) measured at the VENUS-F zero-power reactor in the SCK-CEN research centre (Mol). The core configurations investigated were "representative" of MYRRHA (Multi-purpose hYbrid Research Reactor for High-tech Applications): a LBE-cooled irradiation facility - planned to be built at SCK-CEN operating in critical and subcritical modes - that should demonstrate the ADS technology (by a 100 MW core sub-critical core coupled with a 600 MeV - 4 mA proton accelerator) and contribute to the development of the LFR concept.
   - FREYA (Fast Reactor Experiments for hYbrid Applications, FP7, November 2014 – February 2016): simulation and detailed analyses of experimental measurements performed at the VENUS-F reactor of

some fundamental neutronic parameters in core configurations representative of MYRRHA and ALFRED (Advanced LFR European Demonstrator). Responsibility of Work Package WP4 Task 4.2 (T4.2: LFR critical mock-up characterization) and Task 4.3 (T4.3: LFR critical mock-up reactivity effects). The WP4 foresaw an experimental program in support of the ALFRED design and licensing, whose representative critical mock-up in VENUS-F was defined and designed by ENEA and ANSALDO Nucleare in Task 4.1 (T4.1: LFR mock-up definition).

- MAXSIMA (Methodology, Analysis and eXperiments for the Safety In MYRRHA Assessment; FP7, November 2012 – October 2018). Responsibility of Work Package 2 Task 2.1 (T2.1: Neutronic and shielding analyses in support of safety studies). In compliance with the most recent (post-Fukushima) standards on safety, the project dealt with the safety studies in support of the MYRRHA licensing process. He performed detailed neutronic (and shielding) analyses that provided an envelope for safety studies: all the neutronic input parameters needed for the safety analyses with TH transient codes were evaluated for the minimum and maximum cores in both (critical and sub-critical) operational modes.
- CDT / FASTEF (Central Design Team for Fast-Spectrum Transmutation Experimental Facility, FP7, April 2009 – September 2012), with transfer at SCK-CEN (Mol, B) from March 2010 to June 2012. The main purpose was the design at a rather detailed engineering level of the MYRRHA reactor. Responsibility of WP1 T1.2 (Analysis of MYRRHA FASTEF to operate in critical mode) and WP2 T2.2 (FASTEF design changes to operate in critical mode). Actually, he was responsible of the neutronic activities related to the fuel assembly and core design in both critical and sub-critical operational modes. He also participated in the SCK-CEN working group for the TH and Thermo-Mechanical (TM) design of the primary circuit.
- ELSY (European Lead cooled SYstem, FP6, WP2 T2.2, September 2006 – February 2010): core design and neutronic analyses of a 1500 MW (thermal) LFR, fuelled with MOX and aiming at energy production. Collaboration with ANL (Argonne National Laboratory, USA) for the preliminary study of the 100 MW TPP (Technological Pilot Plant) demonstrator of ELSY.
- EUROTRANS (European TRANSmutator, FP6, WP1.2 T1.2.4; April 2005 – March 2010): conceptual design and neutronic analysis of EFIT (European Facility for Industrial Transmutation), a lead cooled ADS (400 MW sub-critical core coupled with 800 MeV - 20 mA accelerator) aiming at the transmutation of long-lived high-level radioactive waste (*i.e.*, minor actinides).
- PDS-XADS (Preliminary Design Studies of an eXperimental ADS, FP5, WP4.1, November 2001 – October 2004): neutronic characterization of the 80 MW core at the beginning of life and of the equilibrium core for fuel cycle analyses. Sensitivity analyses to evaluate the nuclides and cross-sections energy ranges impacting majorly on the core reactivity.

From 2015 to date, within the FALCON consortium he contributed to the ALFRED core design at engineering level and to the activities foreseen for the licensing process. He performed detailed studies for:

- the shutdown systems design bases and performances, as well as accurate analyses of local perturbation phenomena occurring during the accidental extraction of a control rod. The impact on the power distribution in the hottest assembly (*i.e.*, hot spot) was obtained by a specific procedure in which the neutronic data needed for the TH analyses - at the single fuel pin / sub-channel level - were obtained "even" by deterministic methods;
- an extensive and accurate benchmark activity between deterministic (ERANOS) and Monte Carlo (Serpent) codes, in collaboration with the Energy Department of the Polytechnic of Turin. Using different nuclear data libraries, the study compared the flux / power spatial distributions in nominal and scram conditions by identifying the major similitudes and differences between the codes results (mainly due to the photons transport done by Serpent and not by ERANOS);
- the so-called nuclear data adjustment methodology, adopted to improve the accuracy of the neutronic tools currently in use in ENEA for the LFRs core design. By exploiting the experimental measurements available in the OECD / NEA's IRPhE database and selecting the most ALFRED-representative ones, he simulated accurately (with the ERANOS code) a number of experiments performed in the Big Physical Facility (BFS) at the Institute of Physics and Power Engineering (IPPE, Russian Federation). Successively, several sensitivity and uncertainty (S/U) analyses were performed to assess the impact of the nuclear data uncertainties on the ALFRED core reactivity and on its most important safety-relevant parameters.

In the years 2014-2018, he contributed at the programmatic agreement between ENEA and MiSE with activities related to the validation campaign of neutronic codes and recommendations for the correct application to LFR systems. The campaign relies on the experimental results of the EURATOM FP7 FREYA project and the experimental tests performed in the LR-0 reactor at the CVR research centre (Řež, Czech Republic). Through the accurate simulation of the LR-0 experiments, the assessment of the capability of the neutronic codes to predict the flux and power distributions was proved for the fission and capture reaction rates of ^{238}U and ^{239}Np isotopes in fuel pins irradiated in LFR-representative conditions.

He was also involved in:

- Years 2019-20: the core design, the neutronic and TH analyses of a LFR prototype fuelled with UO_2 and two commercial LFRs fuelled with UO_2 and nitride fuels (Westinghouse Purchase order n. 4500771039 - 28 March 2019).
- Years 2002-04: the ENEA project TRADE (Triga Accelerator Driven Experiment): a pilot experiment (based on an original idea of C. Rubbia) aiming to demonstrate the ADS concept to be performed at the TRIGA RC-1 reactor in ENEA Casaccia. He carried out detailed neutronic analyses and produced cross-sections at different temperatures for dynamic calculations.
- Years 2001-03: the ENEA-ANSALDO project ADS-DF (ADS-Demonstration Facility): he performed the neutronic characterization of the 80 MW sub-critical core at the beginning of life with different calculation methodologies.

He made shielding and activation analyses for:

- Years 2010-2015: the MYRRHA reactor operating in both critical and sub-critical modes, during the CDT and MAXSIMA EURATOM FP7 projects, in collaboration with the Helmholtz-Zentrum Dresden Rossendorf institute (HZDR, Germany);
- Years 2006-2008: the 350 MWe PWR IRIS (International Reactor Innovative and Secure, owned by Westinghouse Electric Co.) in collaboration with Polytechnic of Milan (PoliMI), Oak Ridge National Laboratory (ORNL), Universities of Georgia and Atlanta (USA). The activity was included in the Programmatic Agreement ENEA-MiSE and in the GNEP (Global Nuclear Energy Partnership) initiative of the DOE (USA). The analyses were performed with the TORT deterministic code to assess the damage to the pressure vessel (and some sensitive components as the in-vessel steam generator) and the activation of the biological shield concrete.

b) Design and neutronic analyses of nuclear applications in innovative cancer therapies, as the BNCT (2001-06) and, more recently (2018 to date), the promising field of the intra-operative radiotherapy (IORT) with fast neutrons (nIORT®). As mentioned in the main part of the CV, the nIORT® research studies with compact DD sources – carried out by considering and simulating the meaningful cases of the breast and brain cancers – have led to very promising results in terms of flux level and related dose rates (□2 Gy (RBE) / min). Otherwise, the activities in the BNCT field were performed by adopting the ENEA TAPIRO research reactor and also a compact DD accelerator as neutron sources. In some details*:*

- Analysis and design of the epithermal neutron column for the TAPIRO reactor (Quick calibration stack zero power, in ENEA Casaccia) aiming at the BNCT treatment of brain gliomas. The activity was included in the ENEA project NUME (Applications of Nuclear Physics in Therapy and Medical Imaging) co-financed by MIUR (Ministry of Education, University and Research). He made a thorough study of the geometry and materials used for the construction of the epithermal column, that moderates and conveys neutrons toward the irradiation window. By adopting an anthropomorphic phantom, the MCNP analyses have led to optimise the reference dosimetric and therapeutic parameters. Exploiting the experience in the photometric field, he made an analogy between the neutron column-collimator and the not-image optical systems, that allowed to optimise the column design shape by improving significantly its performances.
- Study of BNCT applications with compact neutron sources, such as the DD accelerator produced by Lawrence Berkeley National Laboratory and installed at the Experimental Physics Department at University of Turin. In collaboration with INFN, Molinette Hospital and EUROSEA consortium (Turin), the preliminary design of the epithermal and thermal columns - for the treatment of deep (*i.e.*, "in situ" for the liver) and skin-deep (explanted organ) cancers, respectively – was performed by using innovative moderator materials (MgF2).

Saluggia (CN), 07/02/2023 In fede