



**The 21<sup>st</sup> International Workshop on  
Ceramic Breeder Blanket Interactions  
(CBBI-21)**

19-21 October 2023

Parque de las Ciencias, Granada, Spain

THURSDAY, 19th October 2023				
				TOPICS
	9:00	WORKSHOP OPENING SESSION		
1	9:20	INVITED . How to define a specification for ceramic breeder pebbles?	<u>Regina Knitter</u> , Milan Zmitko	CB pebble production + 6Li enrichment + properties
2	9:40	ACB Pebble Production: Increasing the Capacity of the KALOS Process in Time for ITER	<u>Oliver Leys</u> , Julia Leys, Regina Knitter	
3	10:00	R&D progress of the tritium breeding functional materials and pebble bed technology for the solid breeding blanket at SWIP	<u>Baoping Gong</u> , Juemin Yan, Hao Cheng, Long Wang, Long Zhang, Xiaoyu Wang, Yongjin Feng	
4	10:20	System design to fabrication the Core-shell type tritium breeder	<u>Young Ah Park</u> , Young Soo Yoon, Yi-Hyun Park	
5	10:40	Long-term annealing performance of Li-6 enriched biphasic Li4SiO4/Li2TiO3 pebbles	<u>Julia Leys</u> , Christina Odemer, Oliver Leys, Regina Knitter	
	11:00	COFFEE BREAK		
6	11:20	INVITED : Status of lithium ceramic breeder materials development, characterizations and R&D activities	<u>Paritosh Chaudhuri</u> , Harsh Patel, Chirag Sedani, Maulick Pancha, Aroh Shrivastava	
7	11:40	Development of Lithium Titanate Ceramic Pebbles By Freeze Granulation and Freeze Drying Method	<u>Aroh Shrivastava</u> , Paritosh Chaudhuri	
8	12:00	Fabrication and characteristics of Li2TiO3 pebbles fabricated by using powder injection molding process	<u>Yi-Hyun Park</u> , Young Ah Park, Young Soo Yoon, Mu-Young Ahn	
9	12:20	ORNL Status and Progress in Research on Ceramic Breeder Blanket Materials	<u>Xiao-Ying Yu</u> , Yutai Katoh, Takaaki Koyanagi, German Samolyuk, and Weicheng Zhong	Irradiation behavior (I)
10	12:40	In-situ neutron irradiation experiment for EU reference ceramic breeder material.	<u>Julia Leys</u> , A. Shaimerdenov, Sh. Gizatulin, T. Kulsartov, Y. Chikhray, I. Kenzhina, M. Ionescu-Bujor, R. Knitter	
11	13:00	Results of neutron irradiation experiments with Li4SiO4/Li2TiO3 at the WWR-K research reactor	Timur Kulsartov, <u>Zhanna Zaurbekova</u> , Regina Knitter, Gunta Kizane, Julia Leys, Asset Shaimerdenov, Saulet Askerbekov, Magzhan Aitkulov, Yevgen Chikhray, Inesh Kenzhina	
	13:20	LUNCH TIME		
12	14:30	Corrosion of F82H in ceramic breeder pebble bed and its effect on hydrogen permeation	<u>Keisuke Mukai</u> , Shunsuke Kenjo, Naoto Iwamatsu, Bakr Mahmoud, Takumi Chikada, Juro Yagi, Satoshi Konishi	Safety issues
13	14:50	Corrosiveness of solid tritium breeders to RAFM steel considering evaporated lithium compound and irradiation.	<u>Qiang Qi</u> , Chi Wang, Yingchun Zhang, Haishan Zhou, Songlin Liu, Guang-Nan Luo	
14	15:10	INVITED . The HCCP Test Blanket Module: Current Status in Development and Qualification of Ceramic Breeder Material and an Overview of Open Issues	<u>Milan Zmitko</u> , Regina Knitter, Alessandro G. Spagnuolo	ITER TBMs
15	15:30	Progress of design and analyses of CN HCCB TBM for ITER	<u>Xinghua Wu</u> , Qixiang Cao, Long Zhang, Xiaoyu Wang	
16	15:50	Microstructure, corrosion behavior, and mechanical properties of ARAA after compatibility test with Li2TiO3 pebbles	<u>Yunsong Jung</u> , Yi-Hyun Park, Duck Young Ku, Youngah Park, Mu-Young Ahn, Seungyon Cho	
17	16:10	INVITED . Design update of the European DEMO Helium Cooled Pebble Bed breeding blanket	<u>Guangming Zhou</u> , Anoop Reteesh, Jin Hun Park, Ion Cristescu, Francisco A. Hernández, Christina Köhly	DEMO-like BB designs
18	16:30	Plans for Breeding Blanket Test Facility in KFE	<u>Mu-Young Ahn</u> , Min Ho Chang, Yoo Lim Cheon, Seungyon Cho, Moses Chung, Hyoseong Gwon, Namll Her, SeongHee Hong, Hyun Wook Kim, Sungjin Kwon, Jae-Uk Lee, Yonghee Lee, Youngmin Lee, Sungbo Moon, Yi-Hyun Park	
19	16:50	Development of a novel breeding blanket using the solid-type PbLi <sub>y</sub> eutectic alloy for CFETR	<u>Kecheng Jiang</u> , Qiuran Wu, Lei Chen, Songlin Liu	
	17:10	Round table, open to topics' discussion		
	17:30	DAY's SESSION CLOSING		

	FRIDAY, 20th October 2023			
				TOPICS
1	9:00	Simulation of Mechanical, Thermal, and Flow Characteristics of Pebble Beds for Solid-type Ceramic Breeding Blanket	<a href="#">Youngmin Lee</a> , Dongwoo Sohn, Mu-Young Ahn, Yi-Hyun Park, Seungyon Cho	<b>Pebble Bed Thermomechanics</b>
2	9:20	Modelling transport of fragmentation and dust particles in granular tritium breeder material inside fusion reactors.	<a href="#">Dario Passafiume</a> , Marc Kamlah	
3	9:40	Effects of vibration conditions, spatial confinement and friction on mixing and segregation characteristics of mixed pebble beds for CFETR WCCB blanket.	<a href="#">Yong Liu</a> , Lei Chen, Cong Wang, Chongyang He, Songlin Liu	
4	10:00	Thermal, uniaxial compression and flow simulations of packed beds of spherical and elliptical shaped pebbles.	<a href="#">Harsh Patel</a> , Maulik Panchal, Paritosh Chaudhuri	
5	10:20	A study of purge flow characteristics and effective thermal conductivity of pebble bed: Experiments and Simulation by ANN	<a href="#">Chirag Sedani</a> , Maulik Panchal, Paritosh Chaudhuri	
	10:40	COFFEE BREAK		
6	11:00	INVITED : Advanced Ceramic Breeders: nuclear performances and assessments.	<a href="#">Iole Palermo</a>	<b>T Inventory + Neutronics</b>
7	11:20	Application of tritium transport model on a DEMO breeding blanket system.	<a href="#">Yonghee Lee</a> , Alice Ying, Mu-Young Ahn, Hyung Gon Jin, Seong-bo Moon	
8	11:40	Development of a system-level code and application to the tritium transport for the water cooled ceramic breeder blanket.	<a href="#">Songlin Liu</a> , Xueli Zhao, Lei Chen	
9	12:00	Tritium transport model of lithium-based ceramic pebbles in Ecosimpro.	<a href="#">Carlos Moreno</a> , Almudena Rueda, Jenifer Serna, Fernando R. Ugorri	
10	12:20	Study on Hydrogen Isotope Permeation Behavior of High-Entropy Alloys Coatings.	<a href="#">Long Wang</a> , Zhihao Hong, Yongjin Feng, Baoping Gong, Xiaoyu Wang, Long Zhang	<b>Safety issues</b>
11	12:40	Microstructural change and deuterium permeation of ZrO2-coated steel exposed to solid tritium breeder pebbles	<a href="#">Takumi Chikada</a> , Wataru Matsuura, Julia Leys, Marcin Rasinski, Suguru Nakano, Jae-Hwan Kim, Taehyun Hwang, Tsuyoshi Hoshino, Masaru Nakamichi	
	13:00	LUNCH TIME		
12	14:00	INVITED : The scope of the future IFMIF-DONES facility and how it can be applied in breeder ceramics	<a href="#">Angel Ibarra</a> and DONES team	<b>Irradiation behaviour (II)</b>
13	14:20	Influence of various radiation types on radiation-induced processes in lithium orthosilicate-based ceramic breeder materials.	<a href="#">Arturs Zarins</a> , Anna Ansone, Mareks Senko, Janis Cipa, Andris Antuzevics, Liga Avotina, Larisa Baumanė, Gunta Kizane, Maria Gonzalez, Julia M. Leys, Regina Knitter	
14	14:40	Secondary Ion Mass Spectrometry (SIMS) as an important tool to track compositional variations from ion-implanted and ion-damaged Advance Ceramic Breeder (ACB) compositions.	<a href="#">Guiomar Delgado</a> , María González	
15	15:00	TEM studies in support of the high radiation resistance of ion-irradiated advanced ceramic breeders.	<a href="#">Marcelo Roldán</a> , María González, Fernando Sánchez	
16	15:20	Is H-isotope effectively trapped in structural defects of ion-beam damaged ceramic breeders?	<a href="#">María González</a> , Marta Malo, Alejandro Moróño, Arturs Zarins, Gunta Kizane, Marcelo Roldán, Fernando Sánchez	
17	15:40	Fabrication and tritium release properties of advanced tritium breeder: Li4(Si---,Ti)O4 ceramic pebble	<a href="#">Jue-min Yan</a> , Baoping Gong, Hao Cheng, Long Zhang, Xiaoyu Wang, Xiaojun Chen, Chengjian Xiao	
18	16:00	Round table, open to topics' discussion		
	16:40	WORKSHOP CLOSING SESSION		