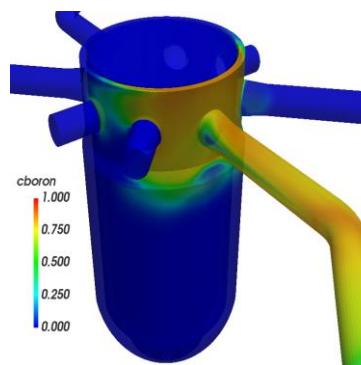


# The International Workshop on Multi-Scale and Multi-Physics Simulation (MMS) of PWRs using CUPID

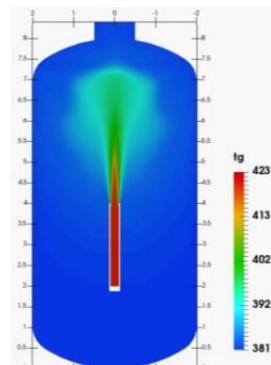
October 20, 2021, On-line, Khalifa University(KU), Abu Dhabi, UAE

The multi-scale analysis, where different length scale codes are used together, can improve the accuracy of current PWR thermal hydraulics analysis which are usually based on the one-dimensional model. High fidelity nuclear reactor simulation also involves multi-physics analysis models of the neutron kinetics, fuel performance, structures, etc. With recent advances in large scale computer simulations, this multi-scale/physics simulation is expected to be used as a practical tool for the next generation safety analysis. This will dramatically improve the prediction accuracy of the convectional safety analysis and could contribute to the enhancement of the advanced PWR safety.

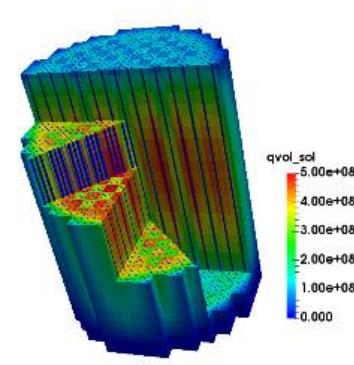
- This workshop will provide the multi-scale and multi-physics simulations of PWRs based on the CUPID code, which is a three-dimensional two-phase flow analysis code developed for a CFD- or component-scale applications.
- In this workshop, the mathematical models of CUPID and multi-scale/physics coupling methods will be presented including their verifications. CUPID standalone applications in CFD- and component-scales will be also presented.
- For a practical use of the multi-scale/physics simulation for PWR safety analysis, full core safety analysis where all the fuel rods are resolved in subchannel-scale is demonstrated using the developed codes for the PWR of steam line break (SLB) accident.



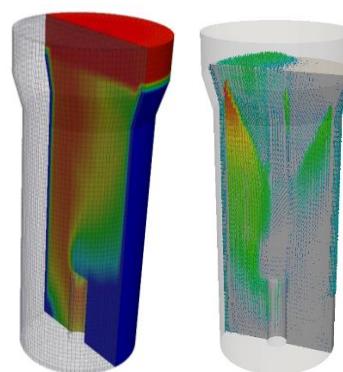
ROCOM flow mixing



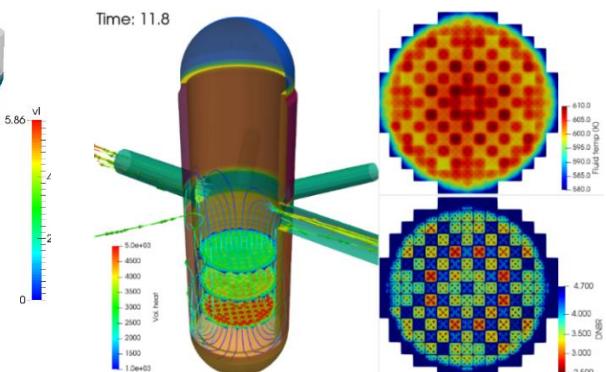
Hydrogen transport



Full core simulation



SG thermal hydraulics



Full core SLB analysis

**Program of the CUPID Workshop (On-line, ZOOM)**

<b>Wednesday (October 20)</b>		<b>Speaker</b>
11:00~11:10	Welcome address	Ki Yong Choi (Vice President)
11:10~11:30	Introduction to CUPID	Han Young Yoon
Session1: CFD-scale applications		
11:30~11:50	IAEA/CRP ROCOM benchmark analysis	Yun Je Cho
11:50~12:10	OECD/NEA HYMERES2 blind benchmark analysis	Ji Hyun Sohn
12:10~12:30	Validation of wall boiling models for DeBORA and FSUBO experiments	Yazan Alattrash
12:30~12:40	Break	
Session2: Steam Generator and Reactor Vessel applications		
12:40~13:00	Reactor Vessel 3D mesh generation and Geometry Based Multi-grid Solver	Ik Kyu Park
13:00~13:20	Multi-scale and Multi-physics Coupling Method	Seong Ju Do
13:20~13:40	Multi-scale and Multi-physics Full Core SLB Analysis of OPR1000	Jae Ryong Lee
13:20~14:00	Application to Small and Modular Reactor(SMR) Conceptual Design	Seung Jun Lee

Organizing Office

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