

M&C 2017

International Conference on Mathematics & Computational Methods
Applied to Nuclear Sciences & Engineering, April 16-20, 2017, Jeju, Korea

Special Session Description

Session Title: Advanced Homogenization Techniques and Leakage Models for Core Calculations

Subject Area: 6. General Reactor Analysis Methods and Applications

Organizer

Jean-Francois Vidal and Igor Zmijarevic

CEA – France

Tel: +33 4 42 25 48 08

+33 1 69 08 84 75

Email: jean-francois.vidal@cea.fr

igor.zmijarevic@cea.fr

Description

Even though the overall ambition in reactor physics analysis with nowadays computational means is to calculate the 3D problems without homogenization, fast and accurate core calculations, especially in design phase and industrial applications, still rely on homogenization techniques that remain to be of topical interest, which is the motivation to organize this session. This special session will comprise theoretical and computational aspects of multigroup cross sections generation using advanced homogenization techniques and leakage models needed to characterize the reference homogenization problems. We expect to cover a wide topics which is given here as a non-exhaustive list of subjects:

- Homogenization techniques for static and transient calculations
- Advanced as well as existing methodology revisited in the context of the new 2D/3D flux solvers
- Leakage models
- Heterogeneous leakage with oriented leakage coefficients
- Equivalence methods
- Discontinuity factors
- Variational formulation and homogenization based on perturbation theory
- Re-homogenization using conditions from core environment
- Power reconstruction
- Advanced methodology for reflector homogenization
- Cross sections generated by Monte Carlo codes
- Cross sections verification or validation by comparison with benchmark results

The session will involve mathematical modeling, deterministic and Monte Carlo numerical methods, and verifications that relate to the mathematical/numerical models.