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## Special Session Description

Session Title:    **Monte Carlo Simulation with Thermal Feedback**

Subject Area:    2. Monte Carlo Methods and Applications

<u>Organizers:</u>

Professor Kan Wang, Tsinghua University, Beijing, China, wangkan@tsinghua.edu.cn
Dr. David Griesheimer, Bettis Atomic Power Laboratory, USA, david.griesheimer@unnpp.gov

<u>Description</u>

To simulate real world reactor physics calculations, Monte Carlo neutron transport methods should be coupled with thermal-hydraulics methods to account for nuclear/thermal-hydraulics feedback effects. Both Monte Carlo and thermal-hydraulics calculations should provide detailed results for their respective calculations, and the corresponding data should be transferred between solvers to achieve converged results such as neutron flux, power density, fuel temperature, and moderator temperature and density distributions.   This special session will cover all the methods and techniques for coupled Monte Carlo and thermal-hydraulics simulations, including

- Methodologies for mapping solution domains between MC and T-H solvers
- Schemes for updating nuclear cross sections on-the-fly to account for changes in material temperatures and densities.
- Theoretical and numerical results related to the efficiency, stability, and convergence properties of MC/T-H coupling algorithms
- Parallel algorithms for coupled MC/T-H simulations
- MC/T-H coupling methods for time dependent simulations, including both short (T-H transient) and long (depletion) time-scales.
- Verification and validation benchmarks for the coupled MC/T-H codes
- Other investigations of the effects of nuclear/thermal-hydraulic feedback effects using Monte Carlo transport methods.