Computing Highlights at ESH&Q

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December, 2017

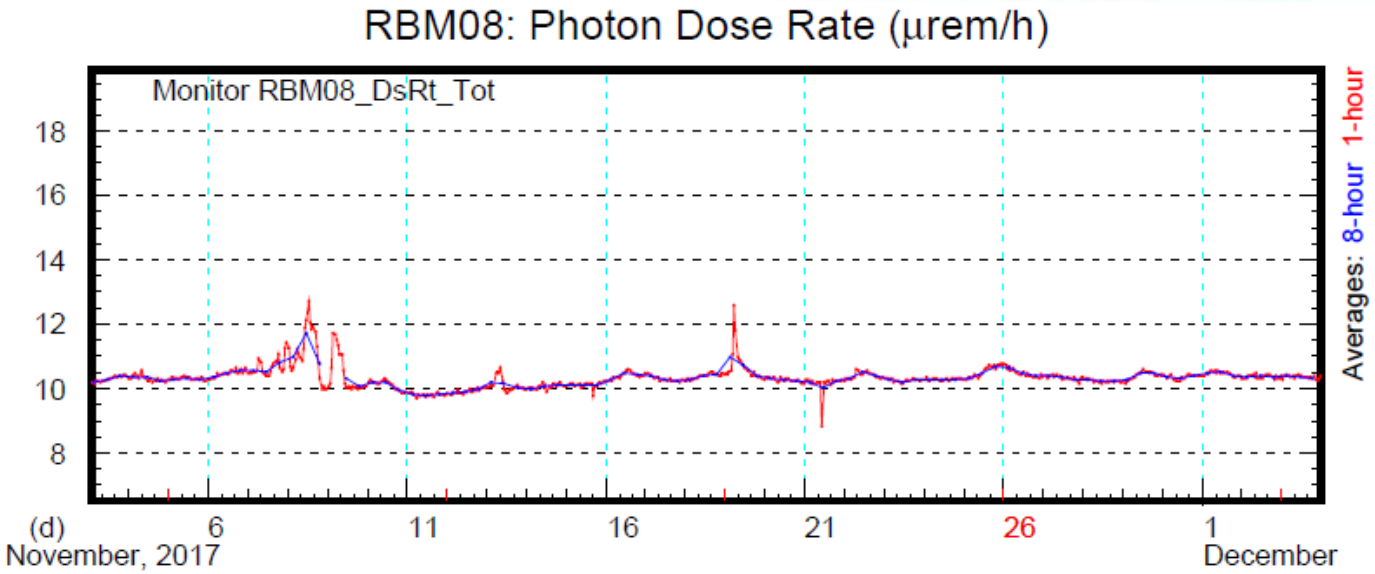
Computing in ESH&Q

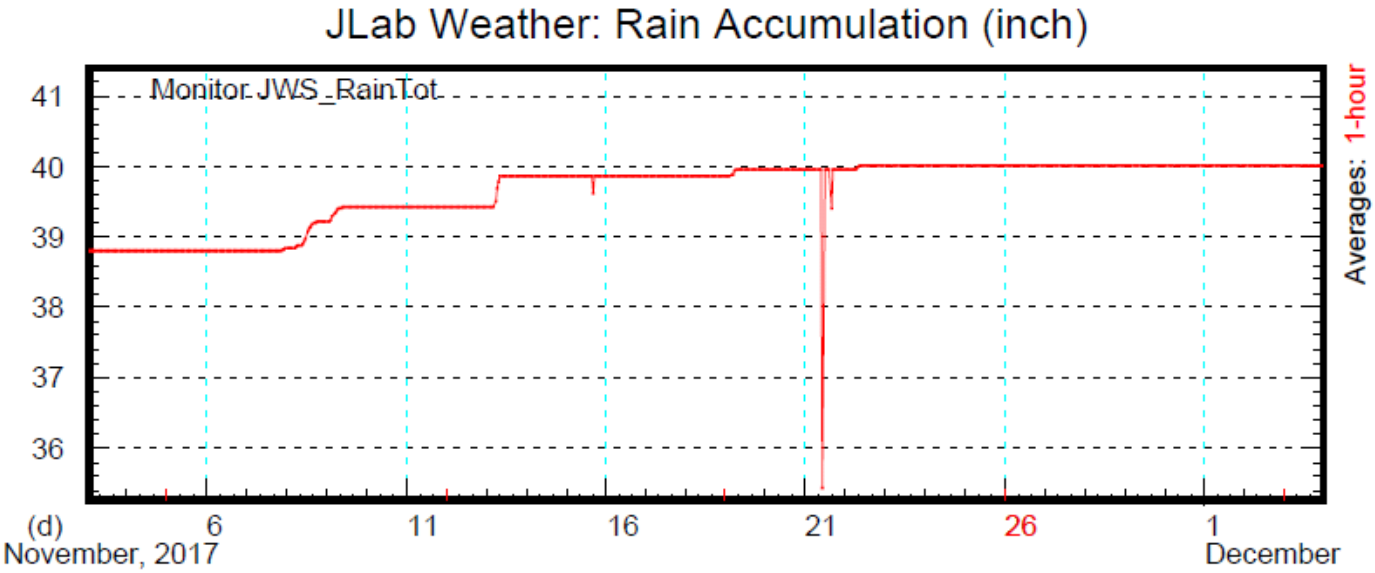
- General ESH&Q databases
  - Compliance, Lessons Learned, etc.
- Document Review and Approval Process / Docushare
- Medical databases
- Industrial Hygiene databases
- RadCon databases
  - Dosimetry, Tours, RAM, RWP, Radiation Shielding
- RadCon Web page
- RadCon data monitoring and analysis
  - Data from area and environmental radiation detectors
- Radiation calculations
  - Varying methods, often computationally expensive

Highlights

- Continuous improvement of the database structure and logic, with the help of the IT department
- New RadCon webpage development
- Update of the RadCon data monitoring and analysis system for 12 GeV operations
  - Example of long term environmental monitoring at CEBAF boundary

Environmental Dose Rates around CEBAF





Radiation Calculations

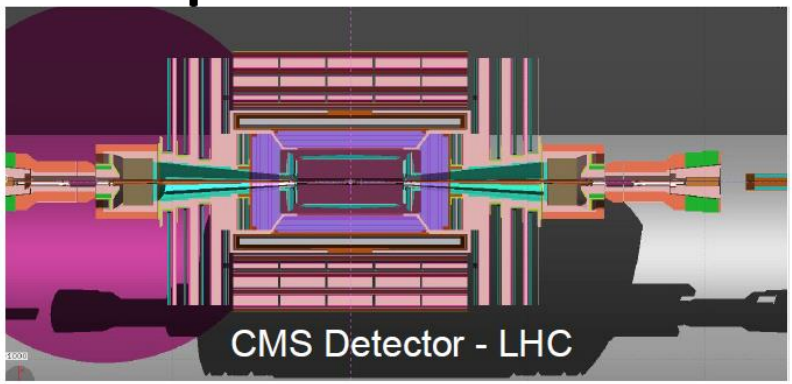
- Small-scale, but often CPU-intensive calculations:
  - Shielding and facility design
  - Radiation backgrounds (safety, damage, activation)
- Simulation codes: GEANT3, Geant4, FLUKA
- Members of FLUKA collaboration
- Benchmarks and code development specific for JLab: photo-, electro-nuclear reactions, isotope production
- Simulations of the radiation detectors' response
- Recent developments: work on the interface between the CAD engineering models and FLUKA, setting up the DAGMC/FluDAG system

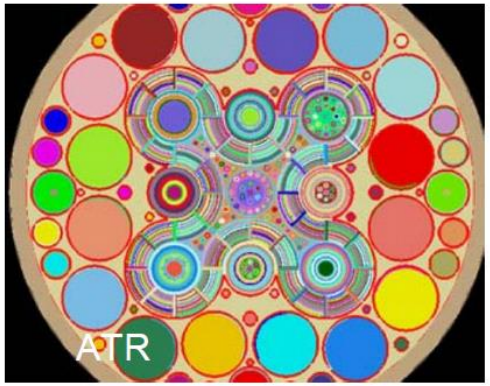
Import Complicated Geometries in FLUKA

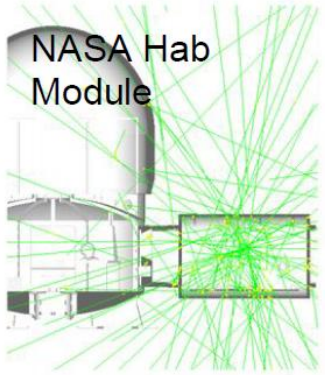
DAGMC by Computational Nuclear Energy Research Group

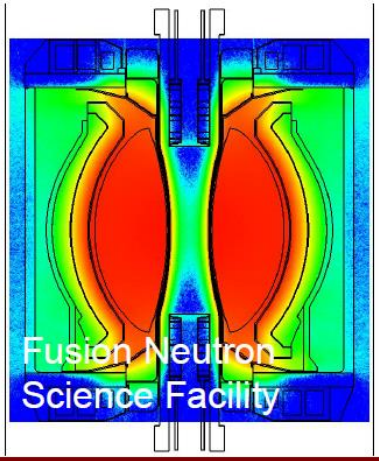
College of Engineering
UNIVERSITY OF WISCONSIN–MADISON

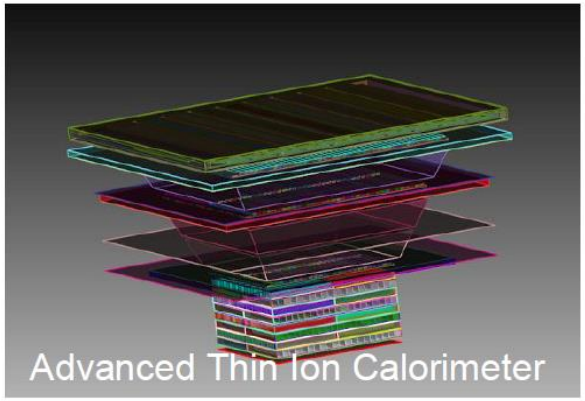
Example uses of DAGMC

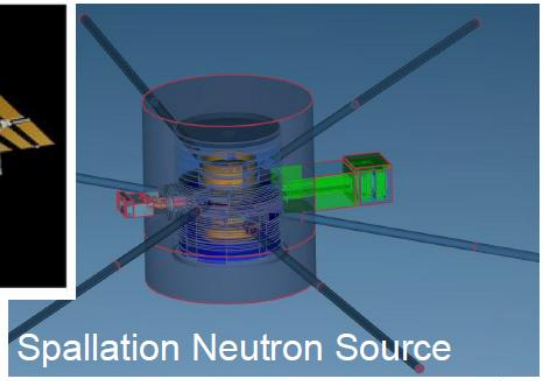












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