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FLUKA Simulations at the ISIS Facility

Monday 9 May 2016 15:00 (30 minutes)

ISIS is a pulsed neutron spallation source located at the Rutherford Appleton Laboratory (UK). The 163 m circumference rapid cycling (50 Hz) synchrotron accelerates 3E13 protons per pulse from 70 to 800 MeV and then delivers these to one of two neutron producing target.
Over the past year there has been a concerted effort to improve understanding of activation of certain accelerator components. This is important as it may help to understand and improve beam setup and tuning procedures, impart extra knowledge for maintenance and help plan for future upgrades to the facility.
Three main projects have been completed so far: a study of the specific activity of W-187 within the second neutron producing target, a study of the activation and residual dose rate of the ISIS beam collimation system (compared to measurements) as reported at IPAC'14, and a study of the impact in terms of beam scattering and activation of the intermediate muon producing target in our proton beamline.
Details of these three projects will be discussed, outlining the approach, results and challenges faced and solved. Our future plans for the use of the FLUKA code within the group will also be discussed (eg potential projects including beam scattering through a thin charge stripping foil located in a strong magnetic field, characterisation of beam loss monitors and scintillator diagnostics, calculating the concentration of tritium in neutron target cooling water, etc)

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Session Classification: User workshop