U.S. Simulation Contributions to Athena

• Two main simulations efforts
  • both are “photon shooters” that do not incorporate raytracing at the moment
  • Both use the same input format, “simput”
  • simx at CfA led by Randall Smith, emphasis on rapid simulation for science assessments (e.g., impact of FoV design choices)
  • sixte at Erlangen led by Joern Wilms
    • Emphasizes detector physics
    • athenawfsim, xifupipeline runs fast wfi and x-ifu simulations, including basic detector physics (in both cases uses a grading scheme and response matrices, similar to simx)
    • tessim – much more detailed detector physics to more properly handle bright sources, crosstalk, etc

• Possible US contributions
  • Improved handling of detector physics, particularly for the X-IFU
  • Helping SWG with simulation work, assessing science impacts of design changes
  • In general assisting with software development as needed
    • Would likely lead to involvement in pipeline software effort since pipeline software will be developed / exercised with end-to-end simulations
  • Assessing needed calibration efforts / impacts of systematic error
Examples

Assessment of spectral resolution degradation with increasing count rate, from Athena SIXTE workshop talk by Philippe Peille

Abell 2146 with X-IFU (T. Dauser/E. Pointecouteau)