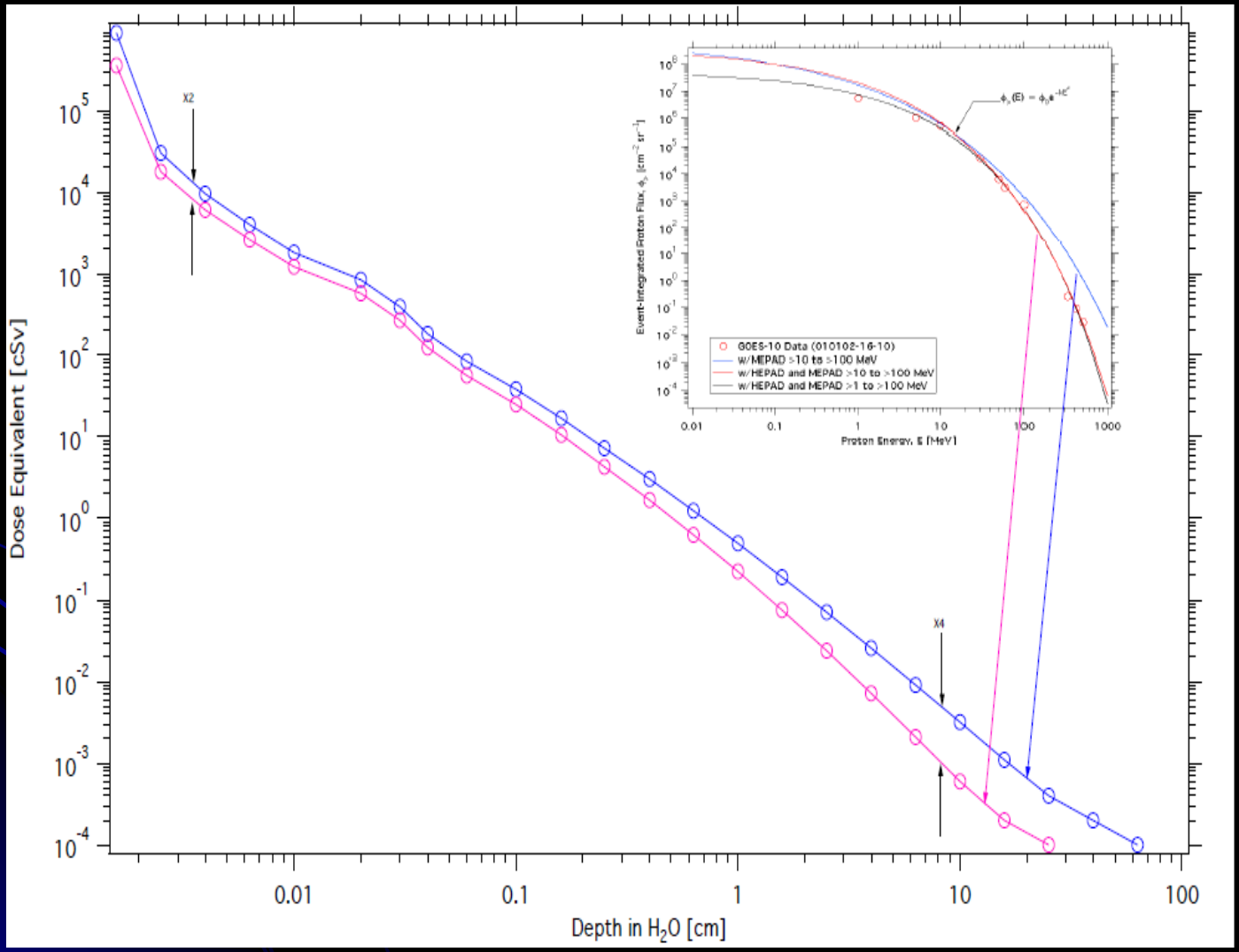
SRAG GOES-VW Series Satellites

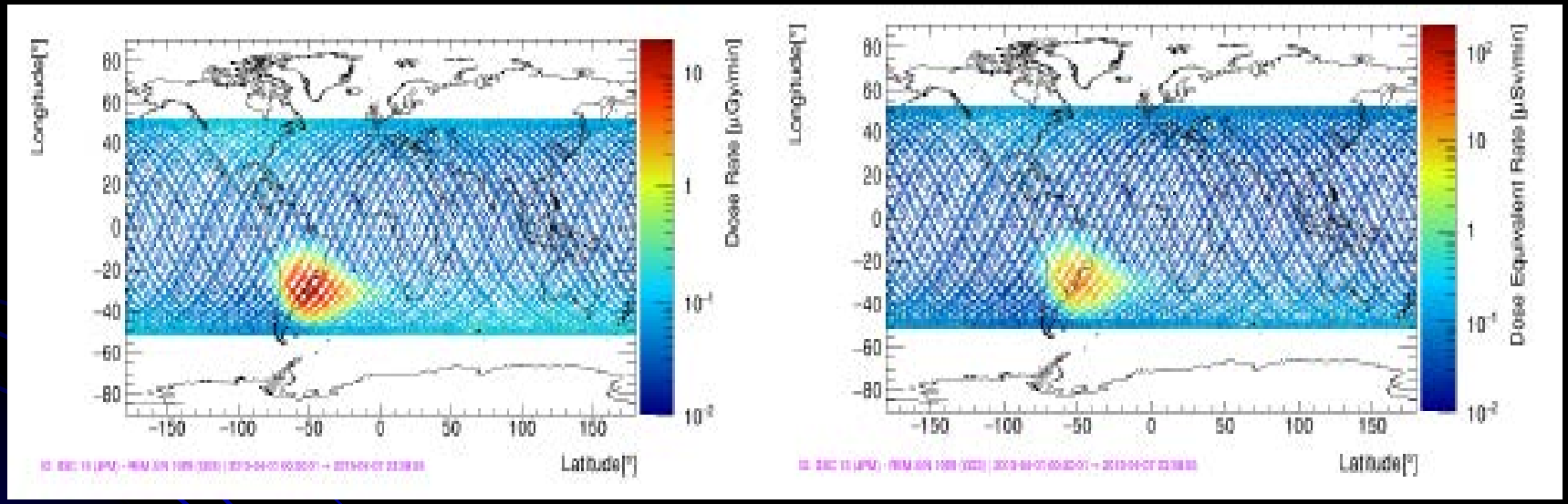
- SRAG Needs
  - Proton and heavy-ion measurements 10 MeV/n – 1 GeV/n
    - Need to nail down the high energy tail of the spectrum of SEPs
      - Something like 7 channels to cover 100 MeV – 1 GeV
      - Various data fits to current data can yield factors of 2-4 difference in total event dose
  - Exploration Missions – Requirements at least out to Mars orbit – Off Sun-Earth line
    - Proton and heavy-ion spectrum measurements 10 MeV/n – 1 GeV/n
    - SEP forecasting with low false alarm rate. Forecast 24-72 hour all-clear periods
    - CME shock arrival prediction capability out to Mars. Accuracy of a few hours.
    - May require STEREO type orbit, L4, L5, or L3
- Fly small particle detectors as a test payload
  - Reduce cost, mass, and volume without giving up particle/energy measurements
  - Single Medipix technology detectors flying on ISS for last two years
  - LUCID (Langton Ultimate Cosmic Ray Intensity Detector) cube design
  - Medipix technology detector stack

Depth Dose Comparison



BACKUP

REM Dose and Dose Eq. Rates (JPM)



LUCID Detector Design

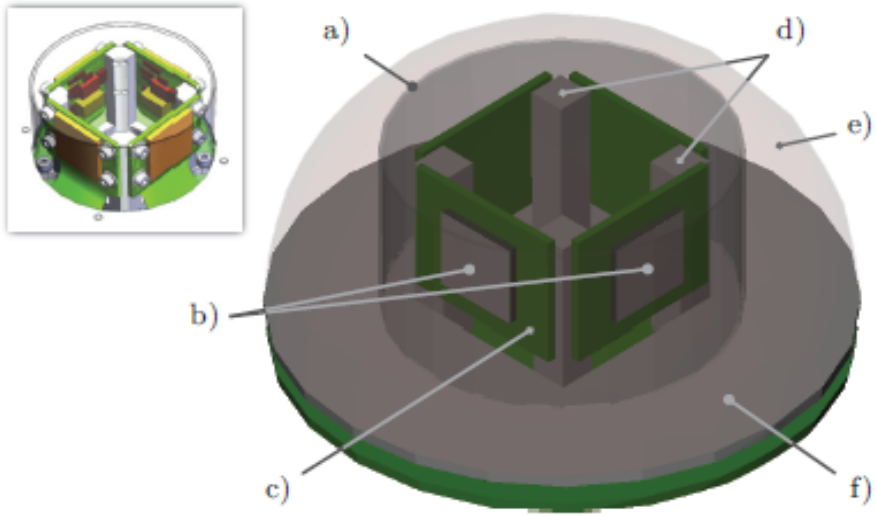


Figure 1. The LUCID experiment as modelled in the `SimLUCID` `GEANT4` application. As described in the text, a simplified geometry has been used that incorporates the major components of the apparatus, namely: a) the aluminium protective "dome" (a closed cylinder with wall thickness 0.7 mm); b) the Timepix detectors (two shown, with five in total including one mounted horizontally in the base); c) the PCB mounts for the Timepix detectors; d) support posts; e) the 50 mm hemisphere where source particles are created, and; f) LUCID's main aluminium covering plate. *Inset*: the Timepix detector arrangement in SSTL's original CAD model for comparison.

T. Whyntie and M A Harrison, Simulation and analysis of the LUCID experiment in the Low Earth Orbit radiation environment. Journal of Physics: Conference Series 513 (2014) 022038