

GOES-16 Space Environment In-situ Sensor Suite (SEISS) Energetic Particle Measurements

Improvements:

The SEISS energetic particle sensors on GOES-16 have an expanded set of measurements. The new sensors measure the following:

Electrons: Energies from 30 eV to >4 MeV in 26 differential energy channels and one >2 MeV integral channel

Protons: Energies from 30 eV to >500 MeV in 40 channels

Heavy ions (28 species from He-Cu): Energies from 10-200 MeV/nucleon in five energy bands

Changes:

Prior GOES series sensors had two integral electron channels (>0.8 MeV and >2 MeV). SWPC alerts are based on the >2 MeV channel. GOES-16 and subsequent satellites in the GOES-R series will only have the >2 MeV integral channel. The >0.8 MeV channel has been replaced by an improved set of differential channels.

A new proton channel measuring the >500 MeV integral flux has been added.

Issues:

In order to extend the range of the electron sensor to energies well below 2 MeV, the electron telescopes have a lower sensitivity than the prior sensors. Consequently, the >2 MeV flux is not well resolved at the low flux levels. Low flux levels appear noisy in the data. High flux levels are well resolved.