



Estimating the energy deposition based on anisotropic fluxes measured by POES MEPED

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The Medium Energy Proton and Electron Detector (MEPED) onboard the Polar Orbiting Operational Environmental Satellites (POES) consists of two electron telescopes, one viewing nearly radially outward from Earth (the 0° detector) and the other viewing antiparallel to the satellite's velocity (the 90° detector). Energetic particle measurements from POES are often used to estimate the energy deposition in the mesosphere. The electron fluxes usually show strong pitch angle anisotropy. Until now, it has been customary to derive a lower estimate of the energy deposition in the mesosphere from the 0° detector, while an upper estimate is derived from the 90° detector. We have developed a method using measurements from both the 0° and 90° telescopes in a combination with theoretically determined pitch angle distributions, in order to give a more precise estimate of the energy deposition in the upper atmosphere. The derived anisotropic flux distributions are used to calculate the energy deposition during Relativistic Electron Precipitation (REP) events.