

论文

由非相干散射雷达数据重建极光沉降粒子能谱

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摘要 本文研究了由极区地面雷达电子密度高度剖面测量数据重建极光沉降粒子能谱的基本原理和方法.在 4~30 keV 能量范围内, 重建结果与FAST卫星实测数在数值水平和变化趋势上基本吻合; 在地磁平静和磁暴期间, 重建获得能谱特征与前人研究结果相一致.该方法开辟了获取沉降粒子能谱特征的一条新途径, 可以弥补卫星能量粒子观测数据磁地方时分辨率的不足, 对于建立空间环境扰动模式具有重要的学术意义和应用价值.

关键词 [非相干散射雷达](#) [电子密度](#) [极光沉降粒子](#) [能谱](#)

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**Initial study of inversion method for estimating energy spectra of auroral precipitating particle from ground based IS radar observations**

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**Abstract** The principles and methods to estimate auroral precipitating particle energy spectra from electron density observations of ground based radar are investigated in this paper. In the energy range of 4~30 keV, the derived auroral electron spectra are reasonably consistent with FAST observations. Under both quiet and disturbed conditions, the characteristics of derived energy spectra are rather similar to some results reported in the past. This method provides an alternative way to obtain energy spectra of precipitating particles, and may also act as the complement of the lower time resolution limitations of satellite energetic particle observations. It is of high value in both academic and applied fields to establish models of space environment disturbance.

**Key words** [Incoherent scatter radar](#); [electron density](#); [auroral precipitating particles](#); [energy spectra](#)

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