

Possible Trend Of Mesospheric Pressure And Temperature Revealed From Meteor Radar Observations In China

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Changes of the atmospheric pressure and temperature in the mesopause are a key issue on how the upper atmosphere responds to lower atmospheric changes.

In this talk, we report the meteor trail echo observations of the two VHF all-sky meteor radars at Mohe (53.5°N , 122.3°E), China operated since August 2011 and at Beijing (40.3°N , 116.2°E), China since December 2008, respectively. From the meteor trail echoes, we evaluate the peak height and profile width parameters from daily echo height distributions at the two radar sites and explore the temporal patterns of the meteor peak heights and profile widths, including climatology and possible trends. The daily meteor peak height and width are determined through a least-squares fitting of the height profile of meteor radar echoes under a normal distribution assumption. There are considerable seasonal variations in the meteor peak height, being dominated by an annual component at Beijing and a semi-annual one at Mohe. There is an annual variation in the meteor profile width at Mohe and Beijing. Moreover, the overall trends in the series of the meteor peak heights and the width parameter at both stations display different pictures, indicating a complicated trend in neutral density near 90 km altitude at middle latitudes. In addition, the meteor peak heights show a rather weak solar activity effect at Beijing, which is different from the positive effects reported at some other sites.