LONG DURATION METEOR ECHOES CHARACTERIZED BY DOPPLER SPECTRUM BIFURCATION

Alain Bourdillon,Christos Haldoupis,Christian Hanuise,Yvon Le Roux and Menard
University Rennes I/CNRS,Campus de Beaulieu,Rennes,France

Abstract:

We report on a new category of long lasting meteor echoes observed occasionally with HF and VHF radars. These meteoric returns, which have lifetimes from several seconds to a few minutes, are characterized by a distinct Doppler spectral signature showing a pronounced Doppler bifurcation which includes narrow bands of discrete Doppler velocities, often of opposite polarity. The spectral properties imply that Bragg scattering cannot be the generation mechanism, therefore these echoes do not associate with the long living meteor-induced backscatter from the unstable lower E region. A reasonable interpretation needs to explain both the Doppler spectrum bifurcation and the long echo duration. As such, we propose the idea of a structured vertical wind shear in the lower E region which traps different fragments of a meteor trail plasma in the same way that sporadic E layers form.