

CHARACTERISTICS OF THE METEOR DISTRIBUTION
AND WIND FIELD OVER THE GEOGRAPHIC SOUTH POLE
USING AN INTERFEROMETRIC METEOR RADAR

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Meteor radars have been routinely used to estimate atmospheric winds in the mesosphere-lower thermosphere (MLT) region by measuring the Doppler signature of the diffusing meteor trails. These trails are ionization columns created by the ablation of meteoroids that enter our upper atmosphere and drift with the wind.

A meteor radar system was installed at the South Pole in 2001 to measure the horizontal wind field in the MLT region. It uses four 6-element yagi antennas pointing in orthogonal directions for transmission. For reception two independent systems are used: the same yagi antennas used for transmission (COBRA data acquisition system) and an interferometric array of five crossed-dipole antennas (MEDAC data acquisition system). Such a system is capable of locating the meteor trail as well as provide information on a number of atmospheric parameters.

We will present the results obtained using the interferometric receive antenna array. The main characteristics of the meteor distribution over the geographic South Pole will be shown and discussed. Time, altitude, angular, and seasonal distributions show that the bulk of the meteor activity takes place around a concentrated region around the ecliptic plane and is more pronounced during the Antarctic summer. Additionally, we will present the preliminary features of the observed wind field. We notice that the main tidal components during the Antarctic summer are the westward-propagating diurnal and semidiurnal tide (both having wavenumber $s = 1$). More importantly, these interferometric observations allow us to take a first look into the altitudinal structure of the atmospheric waves in the MLT region. We will compare these observational results to previous observations and theoretical expectations.

Abstract Submission Form
2004 National Radio Science
Meeting

Abstract: lau13675

Date Received: September 24, 2004

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2. G - Ionospheric Radio and Propagation
3. (a)
4. C - Contributed Paper
5. No special instructions