

Initial Results from Simultaneous 30 MHz and 50 MHz Jicamarca All-sky Specular Meteor Radar Observations

G. Sugar* ⁽¹⁾, D.Scipion ⁽²⁾, S. Close ⁽¹⁾ and M. Milla ⁽²⁾

(1) Stanford University, Stanford, CA, 94305

(2) Jicamarca Radio Observatory, Lima, Peru

We present results from a new 30 MHz Jicamarca all-sky specular meteor radar (JASMET) that was installed at the Jicamarca Radio Observatory (JRO) in August 2013 and allows for simultaneous and independent observations of specular meteors with use of the JRO's 50 MHz JASMET radar. These radars detect meteors that satisfy the specular condition where the meteor's trajectory is perpendicular to the broadcasted signal. Specular meteors enable wind measurements because the Doppler shift is independent of the meteoroid's velocity. This method differs from nonspecular meteor wind measurements in that at least three specular meteors must be observed to calculate a wind vector, as opposed to only one long duration nonspecular meteor. We compare data collected on August 22-23, 2013 from the 30 and 50 MHz JASMET radars. The 30 MHz radar detected more meteors than the 50 MHz radar, most likely because of the higher sensitivity to meteors with lower plasma densities. However, because of its lower frequency, the 30 MHz radar also detected more overdense meteors, events that previous works have ignored in calculating winds. An overdense meteor is observed when the meteor's plasma frequency is larger than the broadcasted radio frequency, while an underdense meteor is observed when the plasma frequency is lower than the radio frequency. We will compare wind profiles obtained from both underdense and overdense meteors from both radars. The two JASMET radars will be used in a future experiment with the JRO's high power large aperture radar to compare wind profiles obtained from both specular and nonspecular meteors.