MLT winds estimations obtained from specular and non-specular meteor trails at Jicamarca: Preliminary Results

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Many non-specular meteors studies have been conducted with the high-power large-aperture (HPLA) radar at the Jicamarca Radio Observatory (JRO). Studies of interest are the ones that use the high-power meteor trails to estimate Mesosphere and Lower Thermosphere (MLT) winds (85-105 km) by combining 3 or more received signals using interferometry. The main limitation for obtaining the winds with this technique is the presence of the Equatorial ElectroJet (EEJ) particularly strong between 90-110 km.

Here, the authors present the preliminary results of a comparative study of MLT winds obtained from non-specular and specular meteor trails on a coordinated campaign conducted on the night of June 2nd - 3rd, 2016.

MLT winds using non-specular meteor trails were obtained by a combination of two modes for better comparison. The first method used the conventional interferometric approach, while the second method used 3 or 4 non-collinear beams to resolve the MLT winds by implementing the Doppler Beam Swinging (DBS) technique. These two approaches are susceptible by EEJ contamination in the meteor detection, so an additional time was devoted to the detection of the trails in the presence of EEJ.

MLT winds using specular meteor trails were obtained by the Jicamarca All-Sky METeor system that operates at 30 MHz (JASMET 30) routinely since 2015. The specular condition of the received echoes makes the system not susceptible to EEJ contamination. Estimates from the specular meteors are obtained every hour with 2 km meter resolution, while estimates from the non-specular meteors were obtained with high time (~15 minutes) and spatial (~300 m) resolution.