

A Decade of Sporadic Meteoroid Mass Distribution Indices in the Southern Hemisphere Derived from SAAMER's Meteor Observations

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We present determinations of the meteoroid differential mass-index, s , using over a decade of meteor observations from the Southern Argentina Agile MEteor Radar (SAAMER). For this, we employ an autonomous statistical technique to determine this parameter from the measured radar echo amplitudes. Unlike previous studies, we examine the role of the system noise in the determination of this parameter and found that if not taking into account appropriately, the results can yield significant over-estimations of the mass-index. In general, we found that a value of $s = 2.0$ represents SAAMER's results in general agreement with recent studies performed in the northern hemisphere. We explore both, the index interannual and seasonal variability and, unlike previous studies, we found it to be constant, except during the presence of the Southern delta Aquariids meteor shower which is so strong that dominates the meteor counts when present. Our study suggests that using the maximum echo amplitude for these studies is not ideal as it can be biased by many factors which make the inaccuracies larger than the precision estimated by the fitting routine. A method that results in a more direct estimate of the electron line density would be required which takes into account range, gain pattern, system noise, etc.