



Dust impacts detection by multiple electric field antennas, signal interpretation

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Detection of dust impacts by electric field instruments is a relatively new method which provides an interesting opportunity to monitor dust in various parts of our solar system. However, signatures of hypervelocity dust impacts detected by electric field instruments are still not completely understood and explained. This results in problems with signal interpretation. A better understanding of this method is very important for reliable dust impact identification, especially in environments with low dust impact rate. We present a study of various pulses detected by multiple electric field antennas simultaneously in the monopole (probe-to-spacecraft potential measurement) and dipole (probe-to-probe potential measurement) configurations by the Earth-orbiting MMS spacecraft. We show that the identification of dust impacts especially by a single electric antenna is a very challenging issue and that solitary waves and other pulses can be easily misinterpreted as dust impacts. Our results indicate that an impact cloud is in some cases able to influence the potential of the electric field antenna during its expansion.