In situ dust measurements in the solar wind from S/WAVES TDS instrument on STEREO mission

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Dust particles represent an important fraction of the matter composing the interplanetary medium. At 1 A.U. dust mass density is comparable to the one of the solar wind. The large number and broad diversity of dust particles detected by the radio instrument on the STEREO satellites recommend this mission for a closer dust investigation. In situ dust measurements are based on the detection of the charges generated by dust impacts, recorded by the S/WAVES instrument near 1 A.U. since the beginning of the STEREO mission. We study the electric signals produced by these impacts, using the waveform sampler data produced by the TDS subsystem of the radio instrument, connected to three monopole antennas. For this study, we concentrate on macroscopic dust particles (~0.1 microns) whose impact generated nearly simultaneous pulses on the antennas. In particular, we present statistics of typical shapes and features of these signals based on the TDS electric potential time-series and compare the data to a theoretical model of how pulses are generated by charge collection. These results will have implications on dust detection from Parker Solar Probe and Solar Orbiter missions.