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## Magnetic Signatures associated with Dust Impacts on Parker Solar Probe

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As the closest humanmade object to the sun, the Parker Solar Probe (PSP) is uniquely positioned to study inner heliospheric dust. The PSP/FIELDS instrument suite detects dust via short voltage pulses generated by the plasma clouds formed during hypervelocity dust impacts on the spacecraft. Similar dust detection methods have been used on other missions, including Voyager 1 and 2, STEREO, Wind, Cassini, and Solar Orbiter. In addition to the voltage signatures, about 2% of dust impacts captured by Time Domain Sampler (TDS) burst data on PSP/FIELDS are shown to have magnetic signatures measured by the high-frequency winding of PSP's Search Coil Magnetometer (SCM). While magnetic signatures have previously been detected in laboratory hypervelocity impact experiments, they have not been previously reported in space. The signatures are brief (lasting less than 0.1ms), and are associated with high-amplitude voltage signatures. In this work, we present statistics and case studies of dust impacts with magnetic signatures on PSP. We will discuss the TDS calibration required to interpret the measurements physically, along with potential physical mechanisms for the magnetic signatures. We will also present early modeling efforts and implications for future hypervelocity impact studies.