



CME impact on comet 67P

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We present observations from the Rosetta Plasma Consortium (RPC) of an impact of a coronal mass ejection (CMEs) on comet 67P. The CME impacted during a dayside excursion in early October 2015 when Rosetta slowly moved from a distance of ~ 300 km to 1500 km from the comet nucleus. Although this was still deep down in the cometary coma, the CME impact caused a significant disturbance to the plasma environment. As the CME impacted, the magnetic field strength increased to reach a maximum of 250 nT, which is the highest magnetic field strength ever observed at 67P. Lots of magnetic field oscillations and increased fluxes of energized (~ 100 eV) electrons and ions were observed concurrently, and the ionospheric low-energy plasma density increased by roughly one order of magnitude. An interesting phenomenon that could occur during a CME impact is a so-called tail disconnection event, when magnetic reconnection, either on the dayside of the comet or in the tail, causes a large fraction of the tail to be disconnected from the comet. Rosetta, being relatively close to the nucleus, can at best directly observe signatures of dayside reconnection when draped interplanetary magnetic fields of different polarities convects through the plasma environment and reconnects at the location of Rosetta. Rosetta cannot directly observe any tail-side disconnection event due to the orbit constraints. However, signatures of such events might resemble substorm effects in the terrestrial ionosphere with increased wave activity, increased ionization, energization of electrons and possibly ions. We discuss the RPC measurements during the October CME in this context and try to determine if a tail disconnection event could have occurred at this time.