



The role of ion-neutral interaction in the formation of the spatial distribution of accelerated ions in the induced magnetosphere of comet 67P

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In the spring and early summer of 2015 Rosetta observed peculiar ion events in the induced magnetosphere of comet 67P/Churyumov-Gerasimenko. These events appeared again during the dayside excursion of Rosetta, and also in the last months of 2015. In these events accelerated cometary ions dominate the ion spectra measured by the Ion Electron Sensor (IES) of the Rosetta Plasma Consortium. In the 200 eV – 2 keV energy range these ions arrive from the SW direction. During the events the main energy of the population first increases, then saturates and later decreases. We present a mechanism, which can be responsible for these events. The ions are accelerated in the outer magnetosphere then decelerated when they enter the dense inner regions of the cometary neutral atmosphere. Investigating this deceleration mechanism allows us to determine a kind of penetration depth beyond which the accelerated population cannot reach. This mechanism leads to a well-defined spatial distribution of accelerated ions of different energies, which in turn, together with CME induced contractions of the magnetosphere, explain the observed ion events.