

Ion environment of comet 67P during the Rosetta mission

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Rosetta has followed comet 67P from low activity at more than 3 AU heliocentric distance to high activity at perihelion and then out again. We study the evolution of the dynamic ion environment using the RPC-ICA ion spectrometer. In mid to late April 2015 the solar wind started to disappear from the observation region. This was associated with the solar wind deflection reaching 90° , indicating that the solar wind free region formed due to severe mass loading and associated solar wind deflection. In December 2015 the solar wind could once again be seen in RPC-ICA data and in January 2016 Rosetta was more continuously within the solar wind again. Accelerated water ions, moving mainly in the anti-sunward direction kept being observed also after the solar wind disappeared from the location of Rosetta. We report how the accelerated water ion environment changed as Rosetta was located relatively deeper into comet magnetosphere as comet activity increased. Rosetta made two major excursions, one out to 1500 km on the dayside and on to 1000 km cometocentric distance in the nightside. These two excursions give us the best picture of the spatial structure of the ion environment of comet 67P. The nightside data showed a radial ion flow away from the nucleus, with gradually more acceleration of the ions further away from the nucleus, a very different situation from that observed in the dayside.