Observations of low energy ions around the diamagnetic cavity at comet 67P

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We investigate the variations in low energy cometary ions around comet 67P. Detailed measurements of these ions were made possible by implementing a new instrumental mode of the ion mass spectrometer on the Rosetta spacecraft. The nominal time resolution was increased from 192 s to 4 s at the expense of the energy range and the field-of-view.

In this study we focus on ion observations made outside of, but in the vicinity of, the diamagnetic cavity. The ion dynamics here is clearly linked to variations of the magnetic field strength and properties of the electron velocity distribution, manifested by the spacecraft potential. Preliminary results show that the ion flux correlates with the changes of the spacecraft potential. The maximum ion flux is, however, observed about 20 seconds after a sudden decrease of the potential (corresponding to an increase in electron density if electron temperature is constant). We also find evidence of small ion temperature increases both when the spacecraft potential changes fast and at the time of maximum ion flux.