

Comparing the inner-coma ionospheres of 1P/Halley and 67P/Churyumov-Gerasimenko: what are the relevant drivers?

Giotto and Rosetta offered us the best opportunities to probe ionospheres of comets. During the 2-year Rosetta escort phase, different conditions were encountered at 67P and played a key role in the variability of the cometary ionosphere: strong variation in the outgassing rate and in the photo-ionization rate by solar radiation, for instance.

Here we will assess two mechanisms of interest, relevant to the formation of planetary and cometary ionospheres: the ion-electron dissociative recombination and the photo-absorption by the coma. The former has been identified as the main plasma loss process at 1P/Halley and in the lower ionosphere of planets, in absence of transport. The latter is at the origin of the altitude dependence of the electron production rate in the atmosphere.

We will demonstrate that the conditions at 67P have never been like at 1P, and we need to consider 67P from a completely fresh perspective.