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Relationship between inner coma water emissions and ice deposits in comet 67P/Churyumov-Gerasimenko

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Data acquired in April 2015 with the VIRTIS spectrometer on board the Rosetta mission provided information on the possible correlation between the H₂O emission in the inner coma and the exposed water deposits detected in the Hapi region on the 67P/Churyumov-Gerasimenko surface (Migliorini et al. submitted). Further bright spots attributed to exposed water ice have been identified in other regions by OSIRIS at visible wavelengths (Pommerol, et al., 2015) and confirmed in the infrared by VIRTIS-M in the Imothep region (Filacchione et al., 2016). Furthermore, new water ice deposits have been identified in regions located both at the equator and at southern latitudes. These regions might be localised sources of water emissions in the inner coma of 67P/C-G. The present investigation seeks to identify the spatial and temporal correlations between the H₂O emissions in the inner coma and the water ice rich deposits on the surface in order to identify the mechanisms operating at the surface-coma interface. It extends the study already carried out for a limited region located in the comet's neck, and identifies how the observed emissions and deposits evolve with the heliocentric distance, as observed by VIRTIS during the Rosetta escort phase mission.