

Seasonal changes in the subsurface of the Imhotep region as observed by MIRO

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After the arrival of the Rosetta spacecraft at the Churyumov-Gerasimenko comet in August 2014, and continuing until the end of mission in September 2016, the MIRO (Microwave Instrument for the Rosetta Orbiter) performed broadband, continuum measurements at 188 GHz and 562 GHz of the nucleus and coma. In particular, the Imhotep region was observed with a very high spatial resolution giving us an opportunity to investigate the many visible features of the region.

The Imhotep region presents a smooth surface containing a few boulders surrounded by rougher terrain. Using the MIRO measurements obtained in October 2014 and July 2016 we were able to observe a seasonal change in the subsurface properties. Namely a reduced water ice presence and a higher porosity consistent with sublimation as the comet orbits the Sun. We will present the constraints on the subsurface properties and seasonal change we have managed to derive.

Additionally, the MIRO beam scanned over different types of terrain (smooth terrain, boulders and rougher regions) and we are able to provide constraints on the composition of each of these features which we hope will provide important insights into the geology of this region.