

Evolution of the global composition of the coma of comet 67P

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During the two years from July 2014 until the end of the Rosetta mission in September 2016, the MIRO instrument on board the spacecraft has been regularly mapping the emission of 8 molecular lines around 560 GHz (H₂O and its isotopes, CO, NH₃ and CH₃OH) in the inner coma of comet 67P/Churyumov-Gerasimenko. We have used those observations to retrieve the 3-D outgassing pattern of each molecule that we approximated by a 2-D Gaussian profile. This has enabled us to determine the bulk total outgassing rate and location on the nucleus of the peak of outgassing for each molecule. In addition we completed these observations by measurements of column densities of Water, CO₂, CH₄ and OCS observed with VIRTIS (Bockelée-Morvan et al. 2016, MNRAS 462, S170). We derive the evolution of the abundances relative to water of CO, CH₃OH, NH₃, CO₂, CH₄ and OCS. The abundances of CH₃OH, CO, CH₄ and CO₂ significantly increased around and after perihelion time when most of the outgassing was coming close to the illuminated southern pole, and some kept on increasing as the comet moved away from the Sun.