



2D forbidden oxygen line emission maps for various comets

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We present here a photochemical model for oxygen line emissions for various comets at 577.7 nm (green line), 630 nm, and 636.4 nm (red-doublet). The in-situ detection of molecular oxygen by Rosetta (67P/Churyumov-Gerasimenko) and Giotto (1P/Halley) makes an update of the usual photochemical model of oxygen line emissions necessary. As the water production rate is increasing, a 2D approach becomes more suitable rather than the usual 1D approach. Indeed, for very active comets such as 1P/Halley or C/1995 O1 Hale-Bopp, neutral densities are high enough to fully absorb the solar UV flux. The resulting 2D emission maps then do not have a spherical symmetry, and become thus interesting tools to be compared with in-situ and/or ground based observations. One major problem relative to the photochemical models lies in the cross section uncertainties. Based on a Monte-Carlo approach, we have assessed the impact of the uncertainties of the dissociation cross section of the neutral species on the resulting oxygen lines emissions.