



Variation of the water production rate of comet C/2013 US10 (Catalina) from SOHO/SWAN observations throughout its apparition

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The all-sky hydrogen Lyman-alpha camera, SWAN (Solar Wind Anisotropies), on the SOlar and Heliospheric Observatory (SOHO) satellite makes observations of the hydrogen coma of comets. Most water vapor produced by comets is ultimately photodissociated into two H atoms and one O atom producing a huge atomic hydrogen coma that is routinely observed in the daily full-sky SWAN images in comets of sufficient brightness. Water production rates are calculated using our time-resolved model (Mäkinen & Combi, 2005, Icarus 177, 217), typically yielding about 1 observation every 2 days on the average. Here we describe the analysis of observations of comets observed during 2015 and 2016 of bright comet C/2013 US10 (Catalina). C/2013 US10 reached a perihelion distance of 0.82286 AU on 15.7 November 2015. The pre-perihelion leg of the apparition followed an average power law variation of $3.7 \times 10^{29} r^{-1.3}$ molecules s^{-1} , where r is the heliocentric distance in AU. This rather flat variation is not atypical of new Oort cloud comets on their first pass through the inner solar system. Support from grants NNX11AH50G from the NASA Planetary Astronomy Program and NNX13AQ66G from the NASA Planetary Mission Data Analysis Program are gratefully acknowledged, as is support from CNRS, CNES, and the Finnish Meteorological Institute (FMI).