Scattered Lyman-alpha radiation of comet 2012/S1 (ISON) observed by SUMER/SOHO

W. Curdt[1], H. Boehnhardt[1], D. Germerott[1], U. Schuehle[1], S. Solanki[1], L. Teriaca[1], and J. Vincent[1]

[1]Max-Planck Institute for Solar system Research, Goettingen, Germany

During its recent perihelion passage, comet ISON came so close to the Sun that it appeared in the field of view (FOV) of the SUMER spectrometer on SOHO and allowed unique observations at far-UV wavelengths with high spatial and temporal resolution. We report results of these observations completed during the comet's encounter with the Sun on November 28.75, 2013. Our data show the dust tail trailing behind the predicted position of the nucleus seen in Lyman-alpha emission as light from the solar disk that is scattered by micron-sized dust particles. The arrow-shaped tail is offset from the trajectory and not aligned with it. We model the dust emission and dynamics to reproduce the appearance of the tail. We could not detect any signature of cometary gas or plasma around the expected position of the nucleus and conclude that the out-gassing processes must have stopped before the comet entered our FOV. Also the model we used to reproduce the observed dust tail needs a sharp fall-off of the dust production hours before perihelion. We compare the radiance of the dust tail to the Lyman-alpha emission of the disk for an estimate of the dust column density. After observing 18 years mostly solar targets, this was the first time that SUMER completed spectroscopic observations of a comet.