AOGS 2005

EUV observations of sungrazing comets with the SOHO/UVCS instrument

A. BEMPORAD[1], G. POLETTO[2], J. RAYMOND[3] and S. GIORDANO[4]
[1]*Astronomy Dept., Florence University, L.go E. Fermi 2, 50125 Firenze, Italy*
[2]*INAF { Arcetri Astrophysical Obs., L.go E. Fermi 5, 50125 Firenze, Italy*
[3]*Harvard { Smithsonian CFA, 60 Garden St., Cambridge, MA 02138, USA*
[4]*INAF { Torino Astrophysical Obs., Strada Osservatorio 20, 10025 Pino Torinese,Italy*

The LASCO coronagraphs aboard SOHO mission allowed the observation of a large (more than 900) number of sungrazers. This led to many studies which tried to explain their origin and the peculiar shape of the observed cometary lightcurves. However, in the last years a few sungrazers have been observed also in EUV spectral lines by the UVCS instrument aboard the SOHO spacecraft (see [2], [3]). This instrument allows for EUV spectroscopy of sungrazing comets in the _nal stage of their trajectory at heliocentric distances between 1.4 and 10 solar radii. The cometary EUV emission detected by UVCS originated from the cloud of hydrogen produced by the photodissociation of water, but, at these low heights, it is necessary to take into account also strong interaction processes (e.g. mass-loading and charge exchange) between the solar wind and the outgassed material. From these observations, it has been possible to derive cometary parameters such as the outgassing rates and the nucleus sizes, as well as parameters of the coronal plasma encountered by the comet. After a general introduction, I will describe a recent work ([3]) where, for the first time, two sungrazing fragments, unresolved in the white light images, have been identified in the EUV data. I will also give an order of magnitude estimate for the number density of the dust grains in sugrazing comets. First results on the UVCS data interpretation of a new sungrazer observed in 2002 will be also presented here.

References

[1] A. Bemporad, et al., ApJ 620, in press (2005).
[2] J. Raymond, et al., ApJ 508, 410 (1998).
[3] M. Uzzo, et al., ApJ 558, 403 (2001).