Mem. S.A.It. Vol. 87, 196

Memorie della

Oxygen investigation in the Galileian satellites using AFOSC

A. Migliorini[1], M. Barbieri[2], G. Piccioni[1], C. Barbieri[2], and F. Altieri[1]

[1] INAF-IAPS, Istituto di Astrofisica e Planetologia Spaziali, Area di Ricerca di Tor Vergata, via Fosso del Cavaliere 100, 00133 Roma, Italy
[2] Università di Padova, Dipartimento di Fisica e Astronomia, Vicolo dell'Osservatorio 3, 35122, Padova, Italy

Abstract.

Spectroscopy in the visible range of the Galilean satellites is a suitable way to investigate the surface properties of these objects. In recent years, several species, like O_2, O_3, and SO_2, have been detected on the surfaces of these satellites, which were thought to be completely covered only by water ice. The recent detection of the O_2 absorption bands in the Ganymede trailing face (Spencer et al. 1995) led to laboratory experiments in order to better constraint the O_2 phases trapped in the water ice surface (Vidal et al. 1997). The same features were observed also on Europa and Callisto surfaces (Spencer and Calvin. 2002), although a better investigation of their properties and their variability with time is still not fully addressed. We proposed ground-based observations with the AFOSC instrument on the 1.8-m telescope in Asiago, to investigate the Galilean satellites? surface properties, focusing both on the leading and trailing faces of the satellites. We used the Volume Phase Holographic grism covering the spectral range 400-1000 nm, with a spectral resolution of about 5000. In this work, we show results of the observations acquired in November 2014, focusing on the leading faces of the satellites. Data were treated using standard methods of data reduction. Further observations with the same setup, scheduled for February 2015 to observe the trailing face of the Galileian satellites, will complement the program. These observations are in preparation to the future science we will be able to perform with the MAJIS spectrometer on the European JUICE mission.

References

Spencer, J. R., Calvin, W. M., & Person, M. J. 1995, J. Geophys. Res. (Planets), 100, 19049
Spencer, J. R., & Calvin, W. M. 2002, AJ, 124, 3400
Vidal, R. A., Bahr, D., Baragiola, R. A., & Peters, M. 1997, Science, 276, 1839