Highlights of Spanish Astrophysics XII, Proceedings of the XVI Scientific Meeting of the Spanish Astronomical Society held on July 15 - 19, 2024, in Granada, Spain. M. Manteiga, F. González Galindo, A. Labiano Ortega, M. Martínez González, N. Rea, M. Romero Gómez, A. Ulla Miguel, G. Yepes, C. Rodríguez López, A. Gómez García and C. Dafonte (eds.), 2025

Searching for impacts of minor bodies on exoplanets

Gómez, J. F.[1], Bendjoya, P.[2], Niccolini, G.[2], Suárez, O.[2], Anglada, G.[1], Osorio, M.[1], Ortiz, J. L.[1], Blázquez-Calero, G.[1], Amado, P. J.[1], and Lara, L. M.[1]

[1] Instituto de Astrofísica de Andalucía, CSIC, Glorieta de la Astronomía s/n, 18008 Granada, Spain
[2] Laboratoire Lagrange, UMR7293, Observatoire de la Côte d'Azur, Université Côte d'Azur, CNRS, Boulevard d l'Observatoire CS 34229, 06304 Nice Cedex, France

Abstract

Different observational techniques have yielded the detection of more than 5000 exoplanets to date. While these techniques mainly use optical/infrared data, radio observations have the potential to expand the parameter space of detectable exoplanets, and to provide information on important physical processes. In this contribution, we describe a new project to detect impacts of comets and other minor bodies on exoplanets, using observations of water masers at 22 GHz. The presence of this type of emission was reported after the collision of comet Shoemaker-Levy 9 (SL9) with Jupiter in 1994. The detection of a water maser in an exoplanetary system would require the impact of a body releasing several orders of magnitude more water content than the SL9 fragments. Our selected targets are nearby (< 20 pc) stars with young debris disks (< 1 Gyr in age), which may be undergoing a late heavy bombardment. We detail some specifics of our data processing, which takes into account the rotation of the impacted planet. The Doppler correction for this rotation during the observation of each target is needed for an efficient detection of prospective maser lines. Our observations and processing have not yet yielded any water maser detections.

My poster in zenodo.org can be found here