The GAPS 2.0 project for the characterization of exoplanetary atmospheres

Gloria Guilluy (1,2), Alessandro Sozzetti (2), Matteo Brogi (3,4), Aldo Bonomo (2), Paolo Giacobbe (2) and the GAPS team
(1) Dipartimento di Fisica, Università degli Studi di Torino, via Pietro Giuria 1, I-10125 Torino, Italy (gloria.guilluy@inaf.it)
(2) INAF – Osservatorio Astrofisico di Torino, Via Osservatorio 20, I-10025 Pino Torinese, Italy
(3) Department of Physics, University of Warwick, Coventry CV4 7AL, UK
(4) Centre for Exoplanets and Habitability, University of Warwick, Gibbet Hill Road, Coventry CV47AL, UK

Abstract

We will describe the ongoing efforts of the GAPS 2.0 project for atmospheric characterization of highly irradiated planets using the simultaneous GIANO-B + HARPS-N (GIARPS) observing mode of the Telescopio Nazionale Galileo (TNG). We will focus in particular on the results and prospects for detection of the individual contributions of atomic (Helium) and molecular (e.g., water, methane, carbon dioxide, hydrogen cyanide) species for constraining the planet C/O ratio and for studying extended atmospheres at high spectral resolution with the GIARPS near-infrared arm. Thanks to its high spectral resolution (R ~ 50 000) and its wide spectral coverage (0.95-2.45) μm, GIANO-B is indeed one of the best suited current spectrographs to perform studies of exoplanetary atmospheres.