

ESPRESSO: the VLT planet hunter

N. C. Santos (1,2), for the ESPRESSO team

(1) Centro de Astrofísica, Universidade do Porto, Rua das Estrelas, 4150-762 Porto, Portugal

(2) Departamento de Física e Astronomia, Faculdade de Ciências, Universidade do Porto, Rua do Campo Alegre, 4169-007 Porto, Portugal

Abstract

ESPRESSO, the Echelle SPectrograph for Rocky Exoplanets and Stable Spectroscopic Observations, will be the next VLT high resolution spectrograph. ESPRESSO will be installed at the Combined-Coudé Laboratory of the VLT and linked to the four 8.2-m Unit Telescopes (UT) through four optical Coudé trains. ESPRESSO will combine efficiency and extreme spectroscopic precision, and is foreseen to achieve a gain of two magnitudes with respect to its predecessor HARPS, as well as to improve the instrumental radial-velocity precision to reach the 10 cm/s level. It can be operated either with a single UT or with up to four UTs, enabling an additional gain in the latter mode. With its unique technological capabilities, ESPRESSO will allow to explore new frontiers in most domains of astrophysics that require precision and sensitivity. The main scientific drivers of ESPRESSO are the search and characterization of rocky exoplanets in the habitable zone of quiet, nearby G to M-dwarfs and the analysis of the variability of fundamental physical constants. Many other scientific cases can and will be addressed by ESPRESSO. The project passed the final design review in May 2013 and entered the manufacturing phase. ESPRESSO will be installed at the Paranal Observatory in 2016 and its operation is planned to start by the end of the same year. In this review we will present a review of the ESPRESSO project and its science drivers, with particular focus for the case of exoplanets.