EPSC

European Planetary Science Congress

The search for exoplanets in Kepler stellar light curves using a processing pipeline developed for the space telescope CoRoT

S. Grziwa, J. Korth, M. Pätzold
Rheinisches Institut für Umweltforschung, Abteilung Planetenforschung, Cologne, Germany (Sascha.Grziwa@uni-koeln.de)

Abstract

Rheinisches Institut für Umweltforschung (RIU-PF) is one of the exoplanet detection groups of the CoRoT space mission. RIU-PF developed the software package EXOTRANS for the detection of transits in stellar light curves. EXOTRANS is designed for a fast automated processing of large data volumes.

About 150.000 stellar light curves from the Kepler space telescope have been made available for public use. The Kepler team announced 61 confirmed candidates to date from an ensemble of 2300 potential planetary candidates.

EXOTRANS was adapted to process Kepler stellar light curves. Various variations (star spots, pulsation, flares, stray light, etc.) may overlay the faint transit signals of small exoplanets. Intrinsic brightness variation of the target star is the dominating disturbing factor. The new wavelet based filter technique, VARLET, was developed to handle this problem. The VARLET filter, added to the processing pipeline, separates faint transit signals from intrinsic stellar brightness variations without requiring a priori information about the target star. VARLET differentiates simultaneously variations by frequency, amplitude and shape. The combination of proven and tested filter techniques used for the processing of CoRoT light curves with the new VARLET filter detected most of the Kepler candidates, ruled out official candidates and found many new candidates.