Poster

Splinter Exoplanets

Wavelet based filter methods for the detection and characterization of transiting planets in light curves of space based telescopes

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Stellar variability is one of the main constraining factors for the detection of shallow transits of small planets in high resolution stellar light curves. The Rheinisches Institut fr Umweltforschung (RIU-PF) has developed the software EXOTRANS to detect transits of exoplanets in stellar light curves since the CoRoT space mission (2006-2013). During the following years EXOTRANS was improved with different wavelet based filter methods (VARLET and PHALET) to separate stellar variation, orbital disturbances and instrumental effects from light curves. PHALET was also integrated into our Advanced BLS algorithm to remove detected transits from the light curve to improve the search for additional transits in systems with multiple planets. EXOTRANS removes detections of false positives including most binaries, many diluting background binaries and technical disturbances from the candidate list. Future missions like TESS and PLATO will need automatic detection pipelines like EXOTRANS to process the large number of light curves and to select the best candidates for follow-up observation. In future RIU-PF will further improve VARLET and PHALET for a better characterization of transiting exoplanets as part of the SPP 1992 Exploring the diversity of extrasolar planets Currently EXOTRANS is used to detect transit candidates in light curves of the Kepler successor K2 as part of the KESPRINT collaboration. Many new candidates were detected in K2 light curves and successfully confirmed by ground-based follow-up. Interesting new results of the KESPRINT collaboration are presented.