

Implications of activity of late-type stars for terrestrial planet finding missions

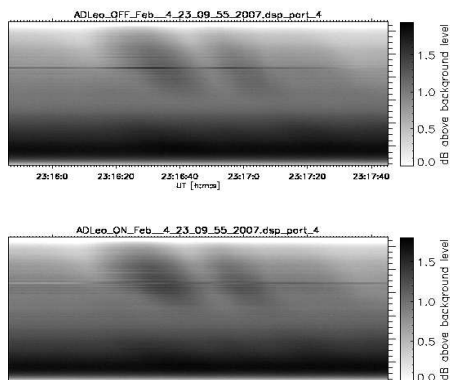
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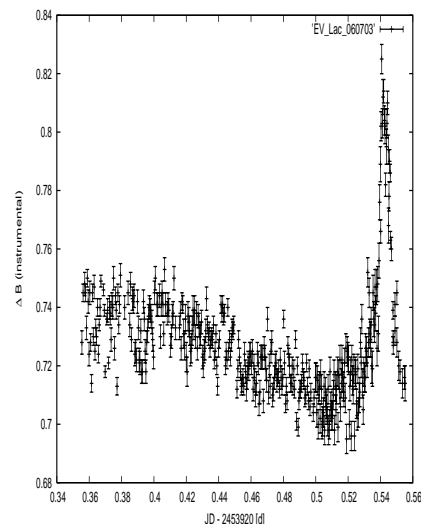
Stellar activity can have major consequences for the habitability of nearby terrestrial planets. In view of forthcoming habitable planet finding missions like Darwin (ESA) and TPF (NASA), a detailed knowledge of the activity characteristics of possible target stars is essential for the design of these missions. We investigate the Coronal Mass Ejections (CMEs)- and Flaring-activity of nearby single main-sequence G, K, and M stars, taking into account the association of decameter radio type II bursts and CMEs on the Sun (1st approach) as well as the fluxratio of the CIII 1176Å multiplet and the CIII 977Å singlet as a diagnostic for electron density (2nd approach).

Three observational campaigns were performed for implementation of the 1st approach. The radio observations were carried out at the UTR-2 of the Radioastronomical Institute of the Ukrainian Academy of Sciences in Kharkov/Ukraine. Simultaneous observations in the optical range (UBVRI photometry, optical spectroscopy) were carried out at the Astronomical Institute of the Slovak Academy of Sciences in Tatransk Lomnica/Slovakia, Grossschwabhausen observing station of the Jena University Observatory and the Observatory Lustbühel of the Institute of Physics/IGAM of the Karl-Franzens University in Graz/Austria, respectively. The 2nd approach is implemented using existing spectral timeseries of G, K, and M stars obtained by the FUSE satellite.

Because the last simultaneous observation was performed from February 4th to February 14th, 2008 (Radioastronomical Institute of the Ukrainian Academy of Sciences in Kharkov and at the observatory in Grossschwabhausen), the data reduction and analysis is still in process. Below, we would like to mention at least an example of the first observational campaign.



The sample of dynamic radio spectra (ON regime-lower panel, OFF regime-upper panel) of AD Leo obtained during the campaign at the UTR-2 with DSP. The zero-point in the colorbar scale corresponds to the background level. The range is given in dB. This example shows the dynamic spectra and drifting structures (from higher to lower frequencies) but appearing too strong to be of stellar nature.



The sample of CCD (50cm Newton telescope, B band) photometry of AD Leo during the 1st campaign. The observations were performed at the Astronomical Institute of the Slovak Academy of Sciences in Stara Lesna. The high energetic events are clearly visible .