

[☞ST-07] Stellar Photometric Variability in the Open Cluster M37 Field on Time-Scales of Minutes to Days

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We present a comprehensive re-analysis of stellar photometric variability in the field of open cluster M37, using our new high-precision light curves. This dataset provides a rare opportunity to explore different types of variability between short (\sim minutes) and long (\sim one month) time-scales. To investigate the variability properties of \sim 30,000 objects, we developed new algorithms for detecting periodic, aperiodic, and sporadic variability in their light curves. About 7.5% (2,284) of the total sample exhibits convincing variations that are induced by flares, pulsations, eclipses, starspots and, in some cases, unknown causes. The benefits of our new photometry and analysis package are evident. The discovery rate of new variables is increased by 63% in comparison with the existing catalog of variables, and 51 previously identified variables were found to be false positives resulting from time-dependent systematic effects. Based on extended and improved catalog of variables, we will review the basic properties (e.g., periodicity, amplitude, type) of the variability and how different they are for different spectral types and for cluster memberships.

[☞ST-08] Wilson-Bappu effect : an indicator of stellar surface gravity

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Wilson and Bappu (1957), for the first time, and other precedent studies (Lutz & Kelker 1975; Pasquini et al. 1988; Dupree & Smith 1995; Wallerstein et al. 1999; Pace et al. 2003) found a tight correlation (called Wilson-Bappu relationship - WBR) between stellar absolute visual magnitude and the width of the Ca II K line emission feature for late type stars. Here we re-visit WBR to claim that WBR can be an excellent indicator of stellar surface gravity of late type stars as well as a good indicator of distance. We have analyzed 103 high-resolution spectra of G, K and M type stars obtained by UVES and BOES by following the method by Pace et al. (2003) for measuring the widths of Ca II K lines(W). WBR found in our samples is $M_V = 33.26 - 17.79 \log W$ and the correlation is very tight. In this study, the stellar gravity($\log g$) has been derived using Kurucz ALAS9 model grid and MOOG code, which can determine T_{eff} and [M/H] too.