

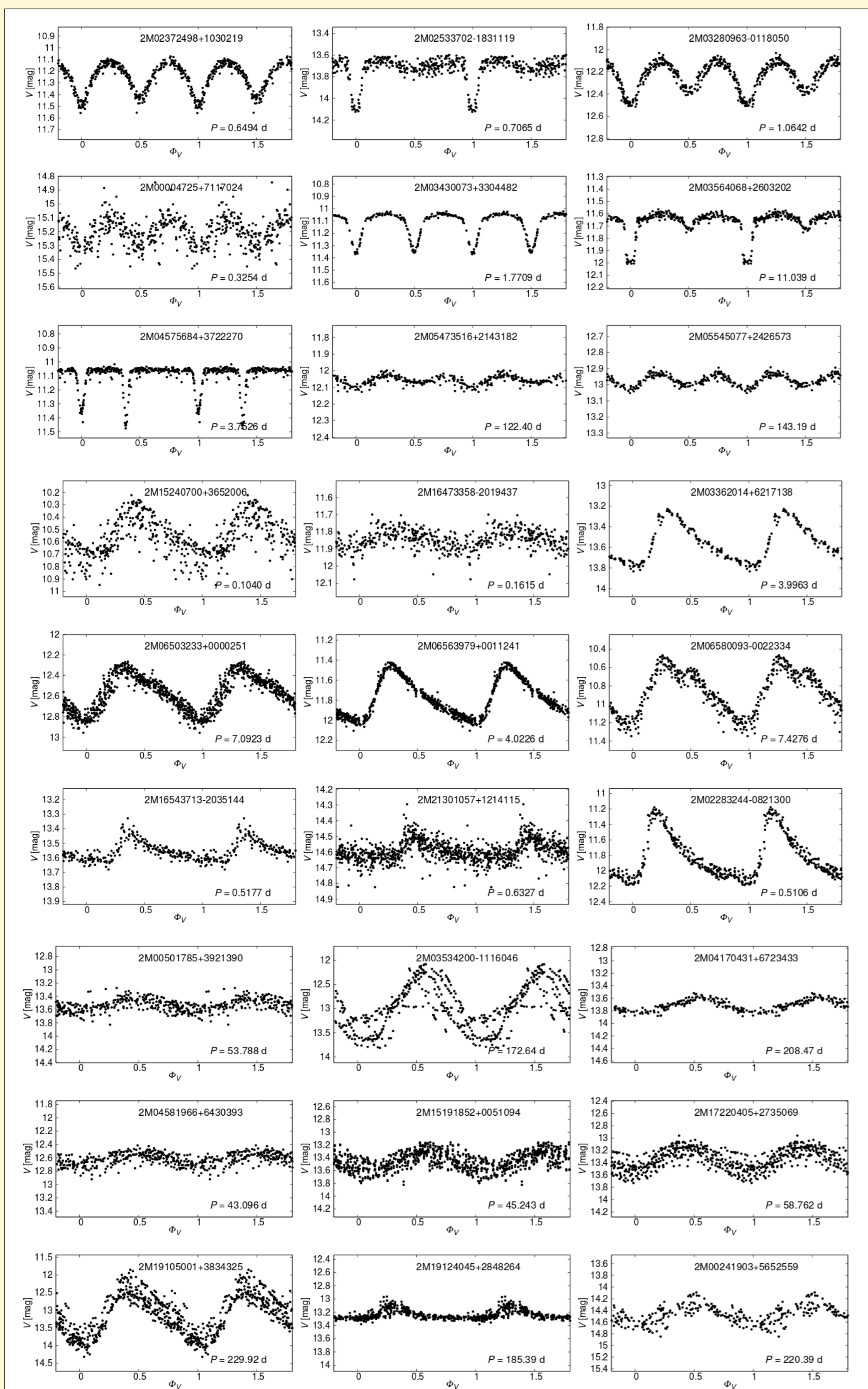
# Variable stars in the ASAS-SN and APOGEE surveys



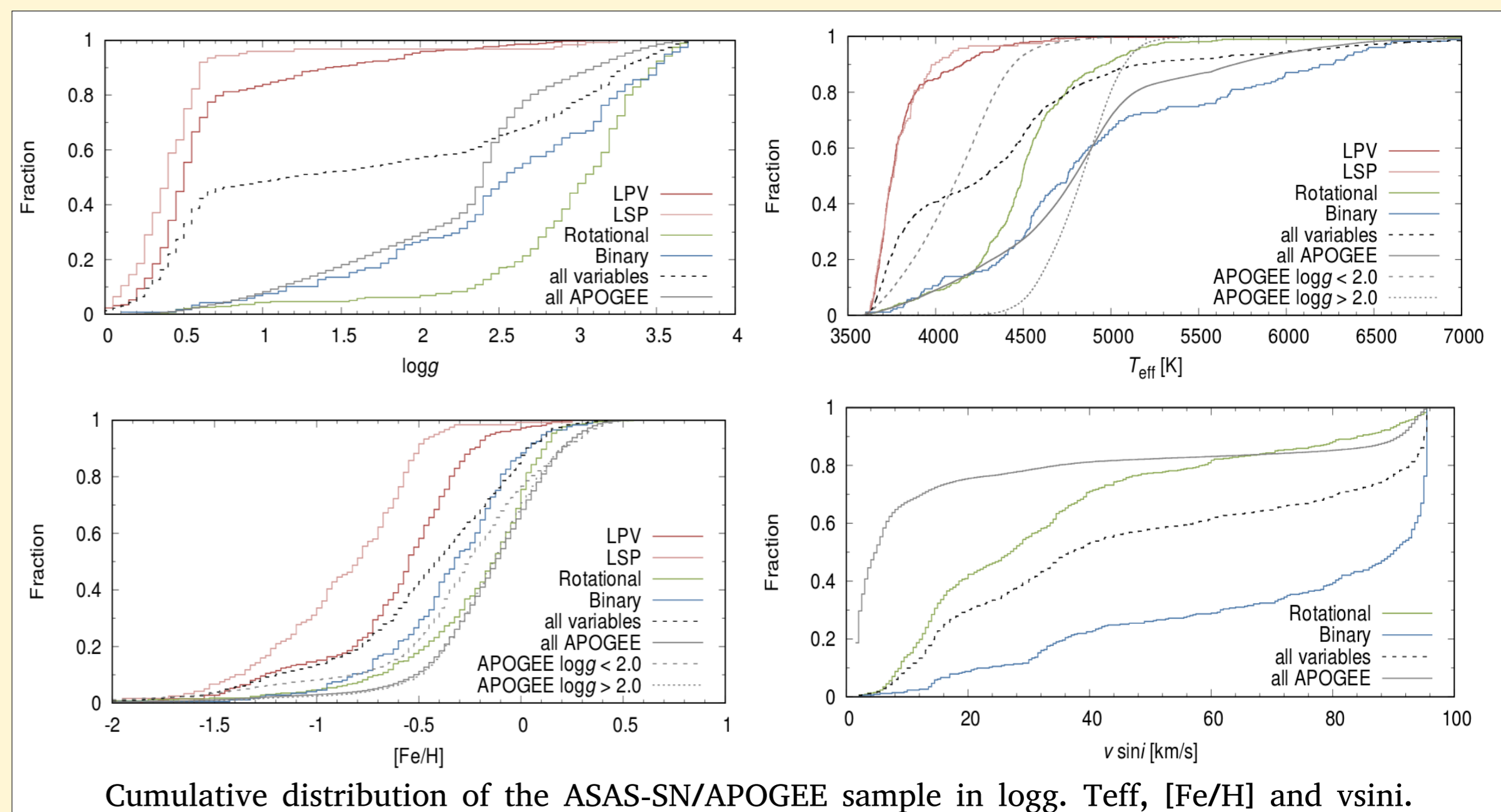
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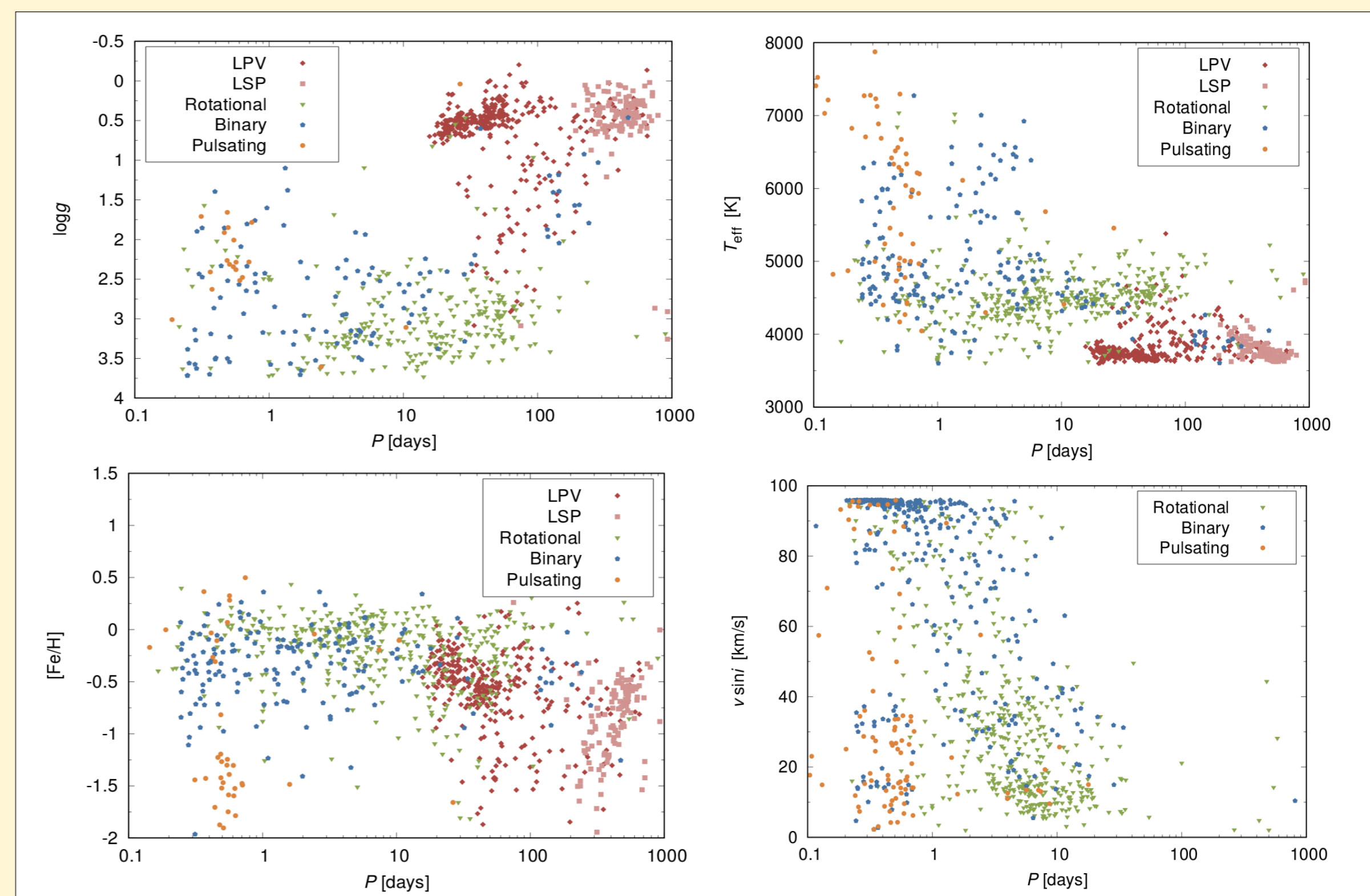
This work presents the results of a search for periodic variable stars among the targets observed by the Apache Point Observatory Galactic Evolution Experiment (APOGEE) using photometry from the All-Sky Automated Survey for Supernovae (ASAS-SN). The catalog consists of 1925 periodic variables selected from more than 258000 APOGEE targets. The sample is homogeneously classified into 430 eclipsing and ellipsoidal binaries, 140 classical pulsators (Cepheids, RR Lyrae and delta Scuti), 720 long period variables (pulsating red giants) and 635 rotational variables. The search was performed using both visual inspection and machine learning techniques. The light curves were also modeled with the damped random walk stochastic process. The median  $[Fe/H]$  of variable objects is lower by 0.3 dex than that of the whole APOGEE sample. The median of eclipsing binaries and ellipsoidal variables is shifted to the lower  $[Fe/H]$  by 0.2 dex. Eclipsing binaries and rotational variables exhibit significantly broader spectral lines than the rest of the sample.



Example light curves the variable stars from ASAS-SN/APOGEE the sample.



Cumulative distribution of the ASAS-SN/APOGEE sample in  $\log g$ ,  $T_{\text{eff}}$ ,  $[Fe/H]$  and  $v \sin i$ .



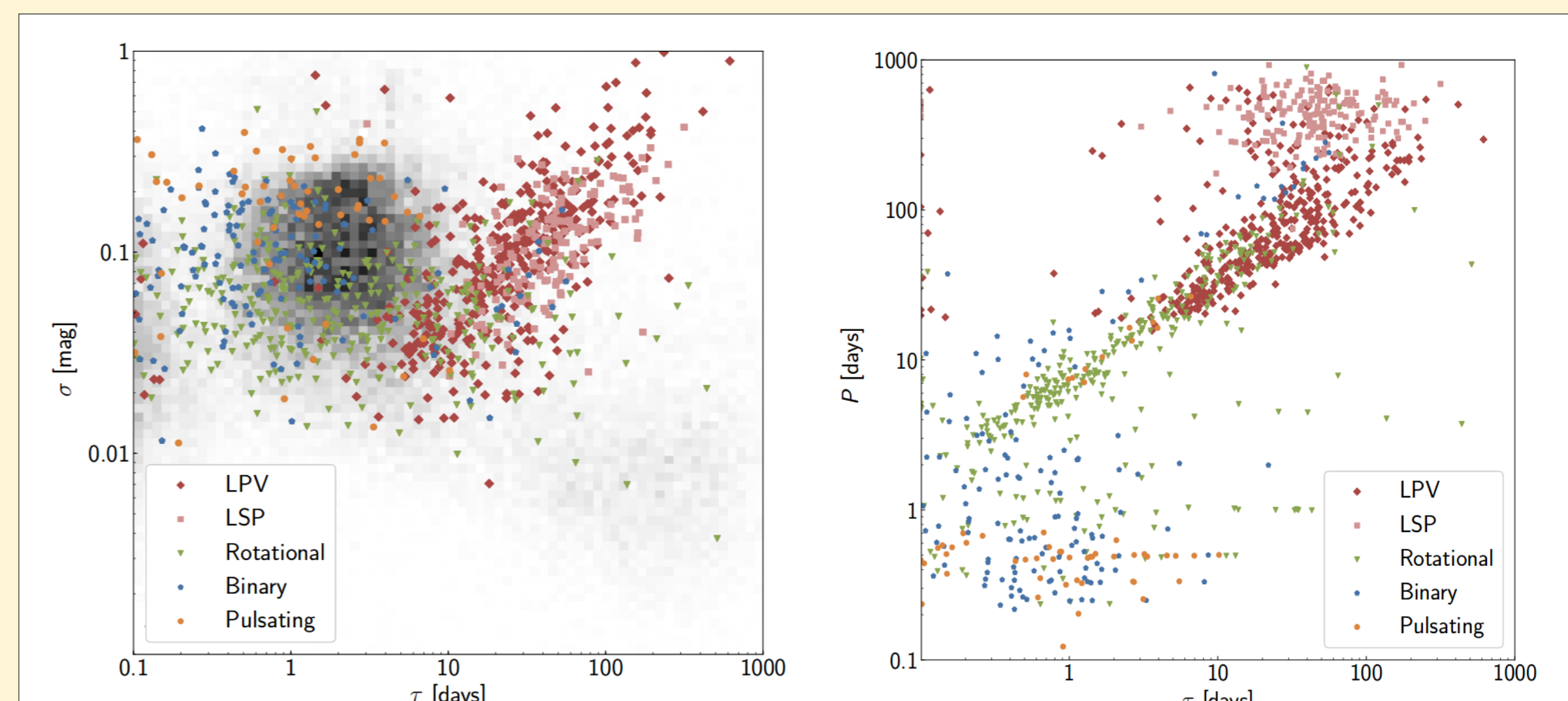
Distribution of the ASAS-SN/APOGEE sample in  $\log g$ -P,  $T_{\text{eff}}$ -P,  $[Fe/H]$ -P and  $v \sin i$ -P plane.



For details of this work please see:  
Pawlak et al. 2019, MNRAS, 487, 5932  
arXiv: 1906.06340

The data is available at:  
<http://asas-sn.osu.edu/variables>  
<http://asas-sn.osu.edu/photometry>

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Results of the DRW modeling of the light curves from the sample.