Find variability period of EA_{up} Catalina stars

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Eclipsing binary systems are enormous importance to astronomy since they are primary means for determining fundamental stellar astrophysical quantities such as mass, radius, and temperature (Andersen, 1991). In particular, in recent years the quality and quantity of astronomical data have been significantly progressed. However in the search for periodicity some surveys such as OGLE, GAIA, Catalina, do not use an appropriate frequency grid to find objects like EA-types. The denomination EA-type comes from a morphological classification of the light curve, that in general, the eclipses of the components are narrow and the primary eclipse is the deepest. In addition, EAs may have few points in the eclipses and this makes it difficult to search variability period. The frequency sampling required to find the periodicity in EAs was recently settled by Ferreira Lopes et. al. 2018. The EA_{up} system classified as unknown period in Catalina survey (Drake et al. 2014) were analyzed in order to verify this concepts. In this work, we report the discovery of variability period of 56% EA_{up} systems, which corresponds to 87 objects which had not been found the periodicity before. In addition, we use the Wilson & Devinney code to estimate individual and orbital parameters of systems. Distance from Gaia (data release 2) and extinction information (Green, 2017) were taken into account in this analysis to characterize the stellar components. The binary systems found are systems with the same periodicity range found by large surveys such as AAVSO and GCVS. The spectral types were compatible with those found by Qian et al. (2018) for EAs, type F-G. Therefore, the method used provides a new opportunity to find and characterize missing systems in large surveys. In order to reaffirm this theory, we will test this approach in others surveys. Our goal is to find and characterize new objects and to discover which objects are being avoided by the commonly used methods.

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