The Properties and Rate of Stars with Blazhko Effects from Gaia and OGLE Surveys

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Blazhko effect which is a long-period modulation in amplitude and period of light variations associated with RR Lyrae stars, has bothered several generations of astrophysicists since it was discovered in 1907. RR Lyrae stars are relatively old, low-mass stars which are located near the horizontal branch in the H-R diagram; it is a mystery why some of them show the Blazhko effect but others do not. Understanding the origin of such an effect would help further clarify some long-standing unresolved issues in the chemical evolution of the low mass star. To collect a larger and more uniform sample of Blazhko stars, we use the public Gaia Data release 2(GDR2) and Optical Gravitational Lensing Experiment (OGLE) database to identify this subclass of RR Lyrae stars in Large Magellanic Cloud (LMC), Small Magellanic Cloud (SMC) and also the galaxy by training multi-layer Artificial Neural Networks (ANN) . Moreover, we study the correlations between pulsating modulations of Blazhko stars (characterized by Fourier series from their light curves), their metallicity and spectral features and we believed the Blazhko effects can affect the Fourier series of the light curve and the metallicity of the star

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