The Relationship Between the Primary Pulsation Period and the Blazhko Effect in RR Lyrae Variables

Clarke, Leonardo (School: Minnetonka High School)

Astronomers who measure light levels of stars have noticed that not all stars emit light at a constant rate. By the 20th century, a star called “RR Lyrae” was discovered to be a variable star whose light levels fluctuate. As a result, a group of variable stars was designated “RR Lyrae variables” after the original star RR Lyrae. This study focused on RR Lyrae stars and a phenomenon that is associated with them: The Blazhko effect. RR Lyrae variables have primary pulsation periods which represent periods of short-term brightness fluctuation. The maximum amplitudes of these fluctuations change over time in a (sometimes) periodic fashion known as the Blazhko effect. The exact causes of the Blazhko effect are not completely understood. This study sought to take a sample of RR Lyrae variable stars, plot their primary pulsation periods, and see if they have a positive correlation with the amplitude or the period of the Blazhko effect. RR Lyrae variables’ light levels are measured by astronomers to gauge distances to globular clusters within and outside of the Milky Way galaxy. Pursuing studies into how these stars behave will further astronomers’ understanding of these fundamental tools of measurement, which could, in turn, contribute to advances in the study of the expansion of the universe as well as large-scale stellar migration patterns.