

Abstract Submitted  
for the CUWIP22 Meeting of  
The American Physical Society

**An Analysis of Eclipsing Binary Systems Exhibiting the O'Connell Effect**<sup>1</sup> ALLISON HELFERTY, ANNIKA STARE, Juniata College — Over half of the stars in our galaxy are binary stars, which consist of two stars orbiting their common center of mass. Eclipsing binaries are variable stars that appear to overlap each other from the Earth's vantage point. One complete cycle includes two eclipses: the primary eclipse, in which the brighter star is obscured, and the secondary eclipse, in which the fainter star is obscured. Some binaries also have a difference in their maxima due to the O'Connell effect, a yet unexplained phenomenon. The O'Connell effect is counterintuitive, as the orientation of adjacent stars should not affect their intensity. In our research, we analyzed the light curves of several beta Lyrae and W Ursa Majoris type eclipsing binaries that exhibit the O'Connell effect. Using the program VSTAR and Excel's Solver tool, we obtained a Fourier fit for their light curves and estimates for the difference in maximum brightness. We will present raw light curves for these binaries along with calculated fits and differences in magnitude. A comparison between our new data and previous observations from the literature can reveal how the orbital period and difference in maximum brightness change over time.

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Date submitted: 11 Jan 2022

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