

## **ABSTRACT**

**THESIS:** The Connection between Delta Scuti Stars and Close Binary Parameters

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With recent advances in CCD technology, it has become possible to detect low-amplitude variability in stars. Thus, the number of low-amplitude variables has increased at an exceptional rate over the past decade. Many of these low-amplitude variables are pulsating stars such as Delta Scuti or Gamma Doradus stars, whose periods are on the orders of hours and days, respectively. One particular place where these variables are being found is in close binary systems. A close binary system has two components separated on the order of tens of solar radii and whose periods are on the order of days. Eclipsing binary systems occur when the orbital plane of the system is aligned such that the stars eclipse each other with respect to Earth's line of sight. Soydugan et al. (2006) presented a paper in which a small number of eclipsing systems with a Delta Scuti-type pulsating component were analyzed. The group derived an observational relationship between the pulsation and orbital periods, thus indicating a physical phenomenon. The proposed project herein will seek to further determine whether there is a statistically significant relationship between the pulsation period and orbital

parameters of close binary systems with a Delta Scuti-type pulsating component by searching for such pulsations in close binary systems using the method of high-precision CCD photometry.