

Pulsars are rapidly rotating, extremely dense neutron stars that emit radio-frequency electromagnetic radiation from regions high above their magnetic polar caps. As pulsars rotate, the radiation originating from this region sweeps through space much like the beam of a lighthouse. There are three main radio beams that create a pulsar's emission pattern: a core beam as well as inner and outer conal beams. Depending on our line of sight and their relative strengths, we may not see all three types of beams. This project examines classical conal double pulsars, which have only two visible components that correspond to an outer cone. Using single-pulse radio-frequency observations from Arecibo Observatory in Puerto Rico, we have identified the other two types of emission from a core and inner conal regions. These weak emission features from the core and inner cone were identified using both high and low frequency observations, as many of the features are frequency dependent. So far, my research has revealed core and inner conal components in the pulsars B0525+21, B1133+16 and B0301+19. These results will lead to more comprehensive analyses of the aforementioned pulsars resulting in a deeper understanding of these "cosmic lighthouses." This research will encourage further close studies of single-pulse observations to reveal similar weak characteristics in other pulsars. The discovery of these features not only informs us about the emission geometries of the pulsars, but also about the interplay between the different types of emission.