A Northern Census for Bow Shocks via the PALFA Survey[1]
DIEGO TAPIA SILVA, University of California, Merced, JIM CORDES, SHAMI CHATTERJEE, Cornell University — We explore regions around newly discovered pulsars in search of peculiar features within the 3 arcminute beam size of the Pulsar Arecibo L-Band Feed Array survey (PALFA). We analyze astrophotography images of 15 newly discovered pulsars from 2013 – 2017. We note interesting characteristics associated with surrounding regions with discovered pulsars. We analyze different wavelength (from IR to X-Ray) images but place an emphasis on optical image analysis, and look for bow shocks within the images which can lead to identifying pulsars and reducing the beam size uncertainty. In total, we analyze 15 distinct beam centered regions and found 4 potential pulsar candidates within the 3 arcminute survey. We note two potential bow shocks in PSR J1932+17 in the H-Alpha image. All other pulsar regions, seen with J1930+24, display only a single potential bow shock. Future follow ups are to be made in order to deeply investigate whether our bow shock regions are actually a direct result of pulsars. We conclude our study by creating a website that contains our processed images, and keep an image collection of the regions of the sky that were analyzed in different wavelengths.

Diego Tapia Silva
University of California, Merced

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