Centennial Honors College

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Poster Presentation

Identification of Zeeman Pair Candidates in a Sample of Interstellar Maser

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Physics

The Zeeman Effect, discovered in 1896 by Dutch physicist Pieter Zeeman, is the splitting of energy levels and spectral lines when an atom or molecule is introduced into a magnetic field. Zeeman splitting can be identified by detecting polarization differences within the profile of a single spectral line. Masers' narrow lines can be used to detect Zeeman pairs, and thus, they can be used to measure magnetic fields in regions of massive star formation where interstellar masers are found. We report a survey for 6.035 GHz OH Zeeman pairs conducted with the 305m Arecibo Telescope. From a sample of 27 sources, we have identified 4 Zeeman pair candidates. The average magnetic field strength estimated from the masers is 2.9 mG, which is approximately 2 orders of magnitude weaker than Earth's magnetic field, but ~2 orders of magnitude stronger than that of typical non-masers Zeeman pair measurements of interstellar molecular clouds in the Galaxy.