

Abstract Submitted
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Detection of Rare Molecular Transitions in a Sample of Massive Star Forming Regions LI LEE, ESTEBAN D. ARAYA, Western Illinois University — The study of molecular transitions is key to characterize the medium where massive stars form. Several molecular species have been used to study star formation, e.g., CH₃OH and H₂O. Molecular line studies at mm/submm wavelength are difficult due to confusion of blending spectral lines and atmospheric opacity. In contrast, observations at ~ 6 GHz are not affected by the atmosphere, and blending of bright spectral lines is unusual. Thus, molecular lines in the ~ 6 GHz range could become new probes to study massive star formation. We report a project aimed to detect rare molecular transitions toward 12 massive star forming regions. The observations were conducted with the 305m Arecibo Telescope. We detected four rare molecular transitions, including the second ever detection of 6.28 GHz H₂CS. We also report tentative detections of 6.85 GHz and 7.28 GHz transitions of CH₃OH, and 7.35 GHz CH emission toward the massive star forming region IRAS18566+0408. These tentative detections are weak but their velocities agree with the velocities of other molecular lines in IRAS18566+0408. We recently submitted an Arecibo proposal to re-observe these lines. If confirmed, we would have discovered three new astrophysical maser transitions.

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