Abstract Submitted
for the PSF15 Meeting of
The American Physical Society

Detection of 19.9 GHz Methanol Emission in Two Star Forming Regions[1] EMMANUEL ADEBAYO, ESTEBAN D. ARAYA, NATALIA ANDREEV, Physics Department, Western Illinois University — Over a hundred molecular species have been discovered in the interstellar medium. One of such molecules is methanol. A rare transition of methanol at 19.9 GHz has only been found as maser toward ten star forming regions (most are weak, <1 Jy). Using the 105m Green Bank Telescope of the National Radio Observatory (NRAO) in West Virginia, we investigated the variability of the 19.9 GHz methanol maser in NGC 7538 (first detected by Wilson et al. 1985) and detected a new emission line in IRAS 18566+0408. Our new detection has a peak flux density of 0.013 Jy. In NGC 7538, the 19.9 GHz methanol maser has an average peak flux density of 0.17 Jy and shows little variability. The velocities of the methanol lines in both sources are offset from the peak 6.7 GHz methanol and 6035 OH masers, but coincident with weaker 6.7 GHz methanol velocity components. Similar velocity offsets have been found in most star-forming regions where the 19.9 GHz methanol line has been detected. IRAS 18566+0408 is a region with weak radio continuum. Consequently, detection of 19.9 GHz methanol maser in this region is atypical to the trend observed by Krishnan et al. (2013), where the maser was found in regions with strong continuum. However, we cannot conclusively rule out the possibility of thermal emission.

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Date submitted: 16 Oct 2015 Electronic form version 1.4