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TITLE: Searching for bio-precursors and complex organic molecules in space using the GBT

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ABSTRACT BODY: Using the latest microwave receiver technology, large organic molecules with abundances as low as $\sim 10^{-11}$ times that of molecular hydrogen are detectable in cold interstellar clouds via their rotational emission line spectra. We report new observations to search for complex molecules, including molecules of possible pre-biotic importance, using the newly-commissioned K-band focal plane array (KFPA) of the NRAO Robert C. Byrd Green Bank Telescope. Spectra are presented of the dense molecular cloud TMC-1, showing strict upper limits on the level of emission from nitrogen-bearing rings pyrimidine, quinoline and iso-quinoline, carbon-chain oxides C₆O, C₇O, HC₆O and HC₇O, and the carbon-chain anion C₄H⁻. The typical RMS brightness temperature noise levels we achieved are ~ 1 mK at around 20 GHz.

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