

COMPLEX MOLECULES IN THE LABORATORY - A COMPARISON OF CHIRPED PULSE AND EMISSION SPECTROSCOPY

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Detecting molecules of astrophysical interest in the interstellar medium strongly relies on precise spectroscopic data from the laboratory. In recent years, the advancement of the chirped-pulse technique has added many more options available to choose from. The Cologne emission spectrometer is an additional path to molecular spectroscopy. It allows to record instantaneously broad band spectra with calibrated intensities. Here we present a comparison of both methods: The Cologne chirped-pulse spectrometer as well as the Cologne emission spectrometer both cover the frequency range of 75-110 GHz, consistent with the ALMA Band 3 receivers. High sensitive heterodyne receivers with very low noise temperature amplifiers are used with a typical bandwidth of 2.5 GHz in a single sideband. Additionally the chirped-pulse spectrometer contains a high power amplifier of 200 mW for the excitation of molecules. Room temperature spectra of methyl cyanide and comparison of key features, such as measurement time, sensitivity, limitations and commonalities are shown in respect to identification of complex molecules of astrophysical importance. In addition, future developments for both setups will be discussed.