THE MICROWAVE SPECTRUM OF AIB

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α-Amino isobutyric acid (AIB) does not occur naturally on Earth, but has been found in sediments at the K/T boundary as well as in carbonaceous chondrites, with abundances similar to or even higher than the smaller amino acids glycine and alanine. As such, it forms an interesting target for observational studies, and could help give some insight into the relative contributions of various pathways before and after planet formation. Unfortunately this is not possible at the microwave and (sub-)millimeter wavelengths of current observatories, because the expected abundances of all these species are too low to be detected. This might change, however, with the commissioning of the SOFIA and Herschel observatories that will operate in the THz region, as the detection limits are expected to drop considerably due to the combination of increased sensitivity and the high intensity of the low-lying THz vibrational modes that these molecules are expected to have. In preparation, the laboratory spectra of these molecules has to be measured.

To aid in the assignment of the THz spectrum of low-lying vibrational modes of AIB, the pure rotational spectrum is first needed. Electronic structure calculations show that AIB follows the same structural trend as the smaller amino acids glycine, alanine and β-alanine. In the lowest lying conformer the amino group is hydrogen bonded to the carbonyl, followed by the hydroxyl OH bonding to the amino group. Preliminary data and analysis of the microwave spectrum measured with the original Flygare FTMW will be presented here.