HIGH-RESOLUTION SPECTROSCOPY ON DOUBLY DEUTERATED AMMONIA UP TO 2.6 THz

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High accuracy spectra of ND_2H up to frequencies of 2.6 THz have been recorded by the use of frequency multiplication techniques in combination with phase locked, high power backward wave oscillators (BWO). For the first time we used novel superlattice (SL) devices as key-element for the generation of higher order harmonics in spectroscopic applications. Odd multiplication factors up to 11 have been achieved and used to measure ground state transitions of the pure rotation and inversion-rotation spectra of ND_2H in the frequency range between 0.08 and 2.58 THz with accuracies of several kilohertz. Energy levels up to quantum numbers $J = 18$ and $K_a = 9$ have been accessed. A greatly extended experimental dataset was obtained with significantly improved accuracies. Besides a technical description of the spectrometer setup, a short presentation and analysis of the spectra will be given in the talk. The improved molecular parameters, derived in the analysis, allowed to generate predictions that can be regarded as a reliable basis for future astronomical high resolution observations throughout the microwave to terahertz regions. These predictions will be available in the Cologne Database for Molecular Spectroscopy (www.cdms.de).