HIGH-RESOLUTION MID-INFRARED SPECTROSCOPY OF DEUTERATED WATER CLUSTERS USING A QUANTUM CASCADE LASER-BASED CAVITY RINGDOWN SPECTROMETER

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The experimental and theoretical study of small water clusters has provided a wealth of information about interactions between water molecules. In order to expand knowledge of these clusters, we have acquired rotationally-resolved infrared spectra of fully deuterated gas-phase water clusters in the intramolecular D_2O bending region near 1200 cm^{-1}. To acquire the spectra, we utilized our continuous-wave cavity ringdown spectrometer (cw-CRDS) which is based on a quantum cascade laser (QCL). The clusters were generated in a continuous supersonic expansion from a 150 μm $\times$ 1 cm slit using argon as the carrier gas. The collected spectra span 1195 to 1200 cm^{-1}, and individual rovibrational transitions have a full width at half maximum of $\sim$20 MHz. We will present our analysis of the collected spectra.