THE GIGAHERTZ AND TERAHERTZ SPECTRUM of MONO-DEUTERATED OXIRANE (c-C$_2$H$_3$DO)

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The rotational spectrum of the chiral mono-deuterated oxirane c-C$_2$H$_3$DO, an isotopomer of oxirane (ethylenoxide), of which the normal isotopomer has already been detected in interstellar clouds, was measured in the ranges 78 to 108 GHz and 25 to 70 cm$^{-1}$. Thus one can expect that c-C$_2$H$_3$DO will be detectable in space in the future given the current accurate laboratory data. c-C$_2$H$_3$DO is also of interest as a simple prototypical molecule for isotopic chirality and parity violation. Previous laboratory work on the rotational spectrum of deuterated oxirane extended only to the frequency of 45 GHz. A total of 119 transitions have been newly assigned in the GHz range (extended to 119 GHz) up to J=18 and 900 transitions in the THz region at most to J=70. The analyses of the rotational spectra shall be discussed in detail in relation to their astrophysical importance.