

## MICROWAVE SPECTROSCOPY OF *TRANS*-ETHYL METHYL ETHER IN THE TORSIONALLY EXCITED STATE 3

KAORI KOBAYASHI, KEIGO MURATA, SHOZO TSUNEKAWA, *Department of Physics, University of Toyama, 3190 Gofuku, Toyama, 930-8555 Japan*; and NOBUKIMI OHASHI, *Kanazawa University, Japan*.

The *trans*-ethyl methyl ether molecule ( $\text{CH}_3\text{CH}_2\text{OCH}_3$ ) has two methyl group internal rotors which are equivalent to the two vibrational motions,  $\nu_{28}$  and  $\nu_{29}$ . There is another low-lying torsional motion which is a skeletal torsion ( $\nu_{30}$ ) and does not cause splitting. The microwave spectra of the *trans*-ethyl methyl ether molecule in the  $\nu_{28} = 1$ ,  $\nu_{29} = 1$ , and  $\nu_{30} = 1$  have been studied and interactions between these states were discussed. In this paper we report results on the  $\nu_{30} = 2$ , and 3 state. The analysis based on Hougen's tunneling matrix formulation considering two methyl groups are used. We try to interpret tunneling parameters obtained in the present analysis quantitatively from the viewpoint of torsion-torsion interaction.