THE MILLIMETER AND SUBMILLIMETER-WAVE ROTATIONAL SPECTRUM OF THE $8^1 9^1$, $6^1 7^1$, AND 2^1 VIBRATIONAL STATES OF NITRIC ACID

DOUGLAS T. PETKIE, *Department of Physics, Wright State University, Dayton OH 45435*; PAUL HELMINGER, *Department of Physics, University of South Alabama, Mobile, AL 36688*; IVAN MEDVEDEV, ATSUKO MAEDA, and FRANK C. DE LUCIA, *Department of Physics, The Ohio State University, Columbus, OH 43210*.

The measurement and analysis of the rotational spectrum of nitric acid in $8^1 9^1$, $6^1 7^1$, and 2^1 vibrational states will be presented. Measurements over the frequency range of 78-118 GHz were made with a phased locked BWO synthesizer and measurements from 118-520 GHz were made using the FASSST spectrometer with a heated cell. The rotational transitions in the $8^1 9^1$ and $6^1 7^1$ states exhibit a $\sim$3.5 MHz and $\sim$1.5 MHz torsional splitting, respectively, and a set of torsional parameters were required to fit the spectra. A Fermi interaction between the $8^1 9^1$ and $6^1 7^1$ states was also included in order to fit all of the observed transitions. There is no resolvable torsional splitting in the 2^1 state and it is free from strong perturbations within the range of measured transitions. The assignments and on-going analyses of several other vibrational states will also be presented.