THz SPECTROSCOPY OF THE $a^1\Delta_g$ STATE OF $O^{18}O$ and $^{18}O_2$.

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Submillimeter-wave rotational spectra of $O^{18}O$ and $^{18}O_2$ in the $a^1\Delta_g$ state have been detected in a new static discharge cell useful for studying rare isotopologues of transient molecules. Rotational transition frequencies of both species have been measured through 1.6 THz, to better than 1 part in 10^7, allowing precise determination of molecular constants. The first measurements with our static discharge cell provide a check on the isotopic predictions in the $a^1\Delta_g$ state.