

Sub-Doppler Measurements and Terahertz Rotational Spectrum of $^{12}\text{C}^{18}\text{O}$

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The five lowest rotational transitions of $^{12}\text{C}^{18}\text{O}$ ($J = 2 \leftarrow 1$ to $J = 6 \leftarrow 5$) have been measured by saturation dip spectroscopy with an experimental accuracy of 1 to 1.5 kHz, employing phase-stabilized backward-wave oscillators. The five J rotational transitions cover the frequency range between 219 and 658 GHz. In addition, we have measured in the Doppler limited mode the rotational transitions $J = 1 \leftarrow 0$, $J = 7 \leftarrow 6$ and $J = 8 \leftarrow 7$. The accuracy achieved for the individual frequencies ranges between 5 and 20 kHz. Moreover the three rotational transitions $J = 16 \leftarrow 15$ to $J = 18 \leftarrow 17$ in the frequency region 1.7–2.0 THz were measured with an accuracy of 15 to 30 kHz by using the Cologne side-band spectrometer for terahertz applications COSSTA.

Key words: Sub-Doppler Measurement; Rotational Spectrum.