TERAHERTZ COHERENT RADIATION GENERATED BY OPTICALLY PUMPING $^{12}CD_3OH$ REVIEW OF MEASURED WAVELENTHS AND FREQUENCIES

E. C. C. VASCONCELLOS, *INSTITUTE OF PHYSICS GLEB WATAGHIN, DEPARTMENT OF QUANTUM ELECTRONICS, STATE UNIVERSITY OF CAMPINAS, CAMPINAS, SP 13083-970, BRAZIL*; M. JACKSON, L. F. S. RIBEIRO, and L. R. ZINK, *DEPARTMENT OF PHYSICS, UNIVERSITY OF WISCONSIN-LACROSSE, LA CROSSE, WI 54601*.

Optically pumped methanol isotopomers have contributed many laser lines to the THz spectral region. Among those, the optically pumped $^{12}CD_3OH$ laser has produced over 400 laser lines in the submillimeter range of the spectrum. In this work we perform a complete and thorough survey of the discovered laser lines in $^{12}CD_3OH$ pumped by laser emissions of either the $^{12}C\ O_2$, $^{13}CO_2$, and $^{14}N_2O$ lasers, along with new measurements. The laser lines are in the THz range of the spectrum, from 0.1 to 10.8 THz (3030 to 27.7 μm) and are characterized by their wavelength, polarization, pump offset, intensity, pressure, and frequency, whenever available. New measurements on already existing laser lines and the discovery of new laser emissions are reported in different specialized journals, and hence a consolidate review on the subject is needed. This coherent submillimeter radiation is an important asset, in a region scarce of coherent radiation sources. Several laser lines, mainly in the high frequency region (below 100 μm) have been applied in spectroscopic studies of free radicals, ions, and molecules. The work presents the discovered laser lines per CO_2 laser branch, wavelength intervals, and number of measured frequencies.