OZONE SPECTROSCOPY IN THE TERAHERTZ RANGE FROM HIGH-RESOLUTION SYNCHROTRON SOLEIL EXPERIMENTS COMBINED WITH FAR-INFRARED MEASUREMENTS AND *AB INITIO* INTENSITY CALCULATIONS

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More than half of the of the outgoing longwave radiation from the Earth to space is located in the FIR part of the electromagnetic spectrum at wavelengths greater than 15 micron. Ozone is one of the most important atmospheric species in terms of the impact on the climate changes and human health. It has a strong absorption in the MW, THz and FIR, though only a relatively restricted part of lines has been experimentally measured in these ranges, which are the most efficient ones for the synchrotron setup at the SOLEIL CNRS equipment, in terms of the brightness if the synchrotron radiation, sensitivity of measurements and S/N ratio. The experimental setup for the ozone SOLEIL project has been previously described [1]. In this work, the analyses of the experimental spectra recorded at four different P*L products for the main ozone isotopologue and the theoretical modeling based on an improved effective Hamiltonian for the line positions and *ab initio* intensity calculations [2 3] will be presented. The results will be given for the simultaneous fit of the rotational band GS-GS , the hot band ν_2-ν_2 and the FIR ν_2 band conducting to the overall weighted standard deviation of 0.8 for 13500 line positions, including all previously available MW and FIR data and the original SOLEIL measurements providing experimental accuracy of 0.00005-0.0001 cm^{-1} for the best lines. The accuracy issues and possible improvements in the SMPO, GEISA and HITRAN databases for large Ka quantum numbers will be discussed. Supports from the CNRS SOLEIL research center for the experimental setup (project N 20211156) and from the RSF project 19-12-00171-P for the theoretical work and data analyses are acknowledged.

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