ABSOLUTE LINE INTENSITIES IN THE 2 μm REGION OF $^{14}\text{N}_2^{16}\text{O}$ AND THEIR TREATMENT USING THE EFFECTIVE DIPOLE MOMENT APPROACH

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This work continues a series of publications devoted to the application of the effective operators approach to the vibrational-rotational treatment of linear triatomic molecules, aiming at the analysis and prediction of infrared spectra of such molecules. In that frame, the present work aims at describing line intensities of cold and hot bands of $^{14}\text{N}_2^{16}\text{O}$ in its ground electronic state in the spectral range above 3600 cm$^{-1}$. Because of the very large spectral range and number of data, the treatment is first done on a polyad-by-polyad basis. The absorption spectra of N$_2$O, at room temperature, have been recorded at a resolution of 0.007 cm$^{-1}$ in the range from 4300 to 5200 cm$^{-1}$ using a Bruker IFS120HR Fourier transform spectrometer. Sample pressure / absorption path length products ranging from 7 to 540 mbar have been used. More than 1000 absolute line intensities have been measured in 21 bands belonging to the $\Delta P = 2\Delta v_1 + \Delta v_2 + 4\Delta v_3 = 8$ series. Using wavefunctions previously determined from a global fit of an effective hamiltonian to about 18000 line positions, parameters of a corresponding effective dipole moment have been fitted to the experimental intensities of cold and hot bands. Results will be presented and discussed.