**CO2-BROADENING COEFFICIENTS IN THE 3 FUNDAMENTAL BAND OF METHANE AT ROOM TEMPERATURE**

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Methane is a minor component of our atmosphere, as well as of Jupiter, Saturn, Uranus, Neptune and Mars. Methane has been detected on Mars by many studies [1,2] and is the main driver for the future ESA mission ExoMars. The origin of methane on Mars is still uncertain: it can be produced through internal processes like volcanic or biological processes, or external ones like cometary impacts. The NOMAD instrument [3] on-board ExoMars mission, has been especially designed to observe CH4 in the 3 fundamental band. However, to retrieve CH4 abundances, accurate spectroscopic line parameters are needed.

The previous studies of methane collisional broadening coefficients in the  fundamental band were devoted to the CH4-CH4, CH4-He, CH4-N2, CH4-O2, CH4-H2, CH4-Ar and CH4-Xe mixtures [4-7]. These works are especially useful for Earth atmosphere. The main component of the Martian atmosphere is carbon dioxide. The CO2-broadening coefficients are thus needed to determine precisely the quantity of methane present in this atmosphere. Very recently, we also determined the CO2-broadening coefficients in the 4 vibrational band [8].

In the present study, we have measured CO2-broadening coefficients of absorption lines in the  fundamental band of methane. Each line was recorded at room temperature (296 K) and for 4 different pressures, comprised between 20 and 60 mbar. The line profiles have been individually fitted, at each pressure, with two lineshapes: the Voigt profile and the Rautian and Sobel'man model which includes the Dicke narrowing. From these fits, we have obtained the collisional half-widths at each pressure and then determined accurately the CO2-broadening coefficients.

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