MOLECULAR LINE PARAMETERS FOR THE ”MASTER” (MILLIMETER WAVE ACQUISITION FOR STRATOSPHERE/TROPOSPHERE EXCHANGE RESEARCH) DATABASE

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The European Space Agency (ESA/ESTEC) is considering the opportunity of developing the spaceborne limb-sounding millimeter sensor ”MASTER” (Millimeter wave Acquisitions for Stratosphere/Troposphere Exchange Research) and in parallel, is developing the ”MARSCHAL” (Millimeter-wave Airborne Receiver for Spectroscopic CHaracterization of Atmospheric Limb - Sounding) airborne instrument. The present paper describes the line-by-line database which was generated mainly for the target species for these instruments (BrO, CH_3Cl, CO, ClO, HCl, HNO_3, N_2O, O_2, O_3 and H_2O) in the 294-305GHz, 316-325GHz, 342-348GHz, 497-506GHz and 624-626GHz spectral microwindows. The best possible line positions, line intensities line broadenings and line shifts parameters were derived (i) from a combination of spectral parameters included in the JPL and HITRAN catalogs (ii) from data taken into the literature or (iii) using data obtained through experimental measurements (and/or) calculations performed during the present study. The available line positions parameters are almost always well characterized for the MASTER uses. As expected, the available air- broadening parameters were not always existing at the required accuracy in the literature, and measurements had to be performed at Bologna and Lille. However surprisingly enough the line intensities had to be re-computed for some of the species under study because of strong deficiencies in the public databases [a].

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