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The GEISA 2008 edition: presentation and evaluation for planetary atmosphere studies

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GEISA (Gestion et Etude des Informations Spectroscopiques Atmosphériques: Management and Study of Spectroscopic Information) is a computer-accessible spectroscopic database, designed to facilitate accurate forward radiative transfer calculations using a line-by-line and layer-by-layer approach[1]. It was initiated in 1976.

Currently, GEISA is involved in activities related to the assessment of the capabilities of IASI (Infrared Atmospheric Sounding Interferometer on board the METOP European satellite -http://earth-sciences.cnes.fr/IASI/)) through the GEISA/IASI database derived from GEISA[2]. Since the Metop (http://www.eumetsat.int) launch (October 19^{th} 2006), GEISA/IASI is the reference spectroscopic database for the validation of the level-1 IASI data, using the 4A radiative transfer model[3] (4A/LMD http://ara.lmd.polytechnique.fr; 4A/OP co-developed by LMD and Noveltis with the

support of CNES (2006). Also, GEISA has been involved in planetary research and, in particular, in the modelling of Titan's atmosphere, in the comparison with observations performed by Voyager (http://voyager.jpl.nasa.gov/), or by ground-based telescopes and more recently by the instruments on board the Cassini-Huygens mission (http://www.esa.int/SPECIALS/Cassini-Huygens/index.html).

The updated 2008 edition of GEISA (GEISA-08), a system comprising three independent sub-databases devoted, respectively, to line transition parameters, infrared and ultraviolet/visible absorption cross-sections, microphysical and optical properties of atmospheric aerosols, will be described.

Results of critical assessments of the spectroscopic databases such as GEISA, HITRAN and MIPAS, in terms of spectroscopic line parameters archived will be presented.

Spectroscopic parameters quality requirement will be discussed in the context of comparisons between observed or simulated Earth's and other planetary atmosphere spectra.

GEISA is implemented on the CNES/CNRS Ether Products and Services Centre WEB site (http://ether.ipsl.jussieu.fr), where all archived spectroscopic data can be handled through general and user friendly associated management software facilities. More than 350 researchers are registered for on line use of GEISA.

Refs:

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2. Jacquinet-Husson N., N.A. Scott, A. Chédin, K. Garceran, R. Armante, et al. The 2003 edition of the GEISA/IASI spectroscopic database. JQSRT, 95, 429-67, 2005.

3. Scott, N.A. and A. Chedin, 1981: A fast line-by-line method for atmospheric absorption computations: The Automatized Atmospheric Absorption Atlas. J. Appl. Meteor., 20,556-564.