<h1 style="text-align:center; color:purple">HITRAN_MIPAS spectroscopic line database
summary of the evolution since version 3.1</h1>

15 April 2003: from HITRAN_MIPAS_PF_3.1 to 3.13

1. PF_3.1 to PF_3.11: removed SF_6 and $ClONO_2$ lines from PF_3.1, generated PF_3.11.

2. PF_3.11 to PF_3.12: NH_3 lines (code = 11) in PF_3.11 were replaced with HITRAN_2K NH_3 lines. Updated parameters (pressure broadening and T-dep.) of H_2O line @ 948.262880 cm^{-1}.

3. PF_3.12 to PF_3.13: replaced OCS lines in PF_3.12 with OCS HITRAN_2K lines. OCS line intensities of the 14 - 1 bands were multiplied by 1.13.

3 November 2003: from HITRAN_MIPAS_PF_3.13 to 3.16

1. PF_3.13 to PF_3.14: removed NO (code 8) lines from PF_3.13, generated PF_3.14 including NO parameters from HITRAN01

2. PF_3.14 to PF_3.15: removed H2O2 (code 25) lines from PF_3.14, generated PF_3.15 including H2O2 parameters from [PERR et al., 1990] and [KLEE et al., 1999]

3. PF_3.15 to PF_3.16: generated PF_3.16 including H2CO (code 20) parameters from J.-M. FLAUD and A. PERRIN, Private Communication.

November 2004: from HITRAN_MIPAS_PF_3.16 to 3.17

1. PF_3.16 to PF_3.17: Updated HNO3 line parameters as described in the tech. Note from Jean-Marie Flaud included in Appendix of the ATBD of MIPAS_SM study.

1 August 2005: from HITRAN_MIPAS_PF_3.17 to 3.2

PF_3.17 --> PF_3.2: Removed from PF_3.17 H2CO lines that are unpublished material and are not relevant for ESA Level 2 retrievals. PF_3.2 is an official release of the database to ESA.

Note: at this time the most exhaustive version of the database is still 3.17.

11 July 2007: from HITRAN_MIPAS_PF3.2 to 3.3:

new MIPAS database version 3.3 issued, compared to V3.2 includes new C2H6 and NO+ line lists. TN from Jean-Marie available at:

http://www2.fci.unibo.it/~ridolfi/mipas_special_modes/db/TN-C2H6-NO+_JMF_noax.pdf

3 May 2008: from HITRAN_MIPAS_PF3.3 to 3.31:
PF3.31 includes new SO2 line data from Jean-Marie. The NU2 region (non usable I think in MIPAS spectra), the NU1 and NU3 regions. The NU3 region is by far the strongest.

9 August 2008: from HITRAN_MIPAS_PF3.31 to 3.32:
Compared to v3.31, v3.32 includes also the 34SO2 contribution.

3 November 2010: from HITRAN_MIPAS_PF3.32 to 3.33:
In v3.33 we include the C3H8 (propane) line data provided by Jean-Marie on 27 November 2009. Note that in the data provided by Jean-Marie the molecule code of C3H8 is 47, whereas in the RFM convention it should be 41 (Marco's error in communication to JM). Therefore while including the data in v3.33 we changed the C3H8 code from 47 to 41.

November 2010: new line data for H2O were supplied by Jean-Marie and tested by Marco. The presentation prepared for the QWG25 meeting (Firenze, 21-23 March 2011) showing the results of the tests is available here:

http://www2.fci.unibo.it/~ridolfi/mipas_special_modes/db/ridolfi_h2o_residuals_qwg25.pdf

ATTENTION: the database contains some lines (e.g. SO2 and CH4) with HWHM (pressure broadening coefficient) equal to zero. This disturbs the broadband forward model (not the ORM where no line-mixing model is included). Therefore now I have put a check in the line selection tool (mwselect.F): if HWHM = 0 the line is discarded.

October – November 2012: Towards the release of hitran_mipas_pf4.n. We started with Jean-Marie and Agnes (LISA) the validation / refinement of the new line list for HNO3 in the 7.6um band (v3 and v4 bands of HNO3, located in the B band of MIPAS):

- Broadband residuals in the B band improve, but not dramatically. Thus we minimized the residuals by tuning the lines intensity of the v3 and v4 bands so that average residual spectra for the obit 2081 are minimized, while the simulation assumes HNO3 retrieved from the old FR Mws (see related poster presented at the ACVE-2013).
- We then checked the average retrieved profiles from orbit 2081 using Mws in the 11um (usual for MIPAS retrievals) and the 7.6 um bands (new Mws selected by Anu, 4/3/13). We find that the best consistency between the HNO3 profiles retrieved from the 2 spectral regions is achieved by decreasing by 7.5% the line intensities in the 7.6 um region (see presentation at qwg31 19/03/2013 @ESRIN).