SFIT4 – Whats new?

Mathias Palm

Institute of Environmental Physics
Universität Bremen

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SFIT4 – What's new?

Input Output structure

- clarification and streamlining of sfit4.ctl – see presentation by Mathias
- names of output files can be defined in sfit4.ctl – see presentation by Jim
- new keys gas.profile and gas.column for the definition of the gases retrieved by profile or column. Gases which are in neither list are not read from the sfit4.ctl. Now a gas can be defined as columns and profile at the same time in the sfit4.ctl.
- the strength of solar lines can be retrieved along with the shift.
- started to compile a set of test cases to test for the quality of the retrieval

SFIT4 – What's new?

KB matrizes

- The error due and the covariance matrix on the retrieved quantity due to an error in a parameter is calculated by

$$\hat{\vec{x}} - \vec{x} = \underbrace{\mathbf{DK_b}}_{A_b}(\vec{b} - \hat{\vec{b}}) \quad (1)$$

$$\hat{S}_b = A_b S_b A_b^T \quad (2)$$

- sfit4 calculates KB matrices for all of the values which can be retrieved and a few more
- The Gain matrix D can either be written out or calculated in the post processing. However, if the Levenberg-Marquardt- Algorithm is used, the Gain matrix should be the one calculated by sfit4

SFIT4 – What's new?

AVK for column scaling retrieval

- AVK or column retrieval is a parameter of how a wrong profile affects the retrieved column

$$\hat{c} = c_A + DK_b^{profile}(x_T - x_A) \tag{3}$$

where x_A is the profile before scaling and $c_A = \sum_i m_A^i x_A^i$ with m_A the airmass at each layer