

Ozone Profile Retrieval from GOME

The Full Retrieval Method (FURM)

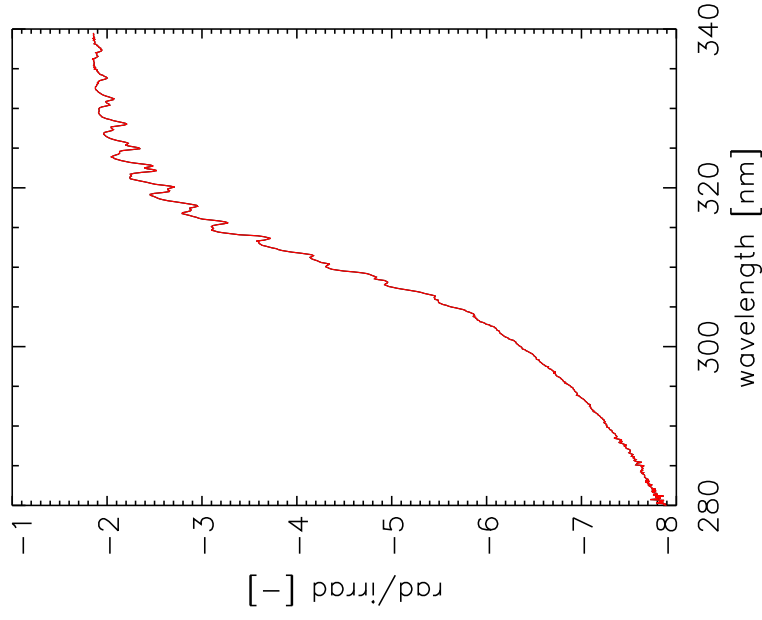
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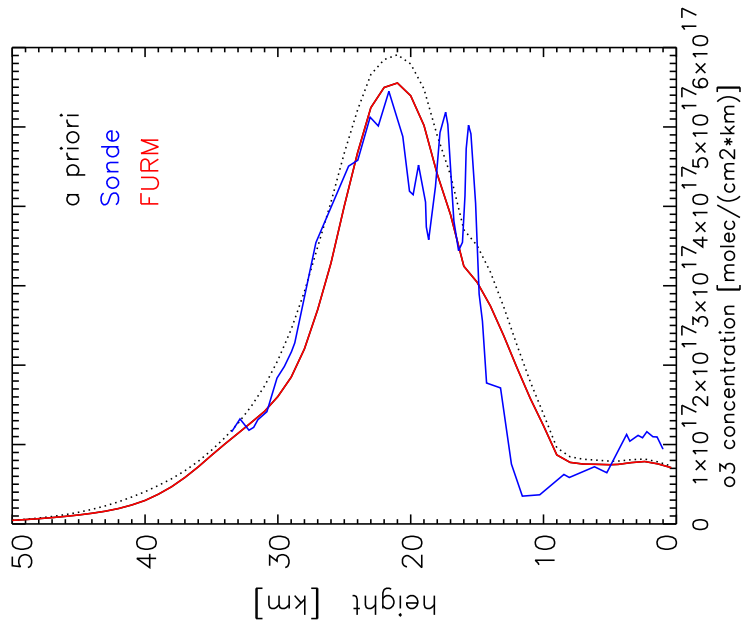
Ozone Profile Retrieval from backscattered UV

GOME Spectra



Inversion \rightleftarrows
Forward Model

O₃ Profile



atmospheric parameters: Ozone, NO₂, Temperature, Pressure, Albedo,...

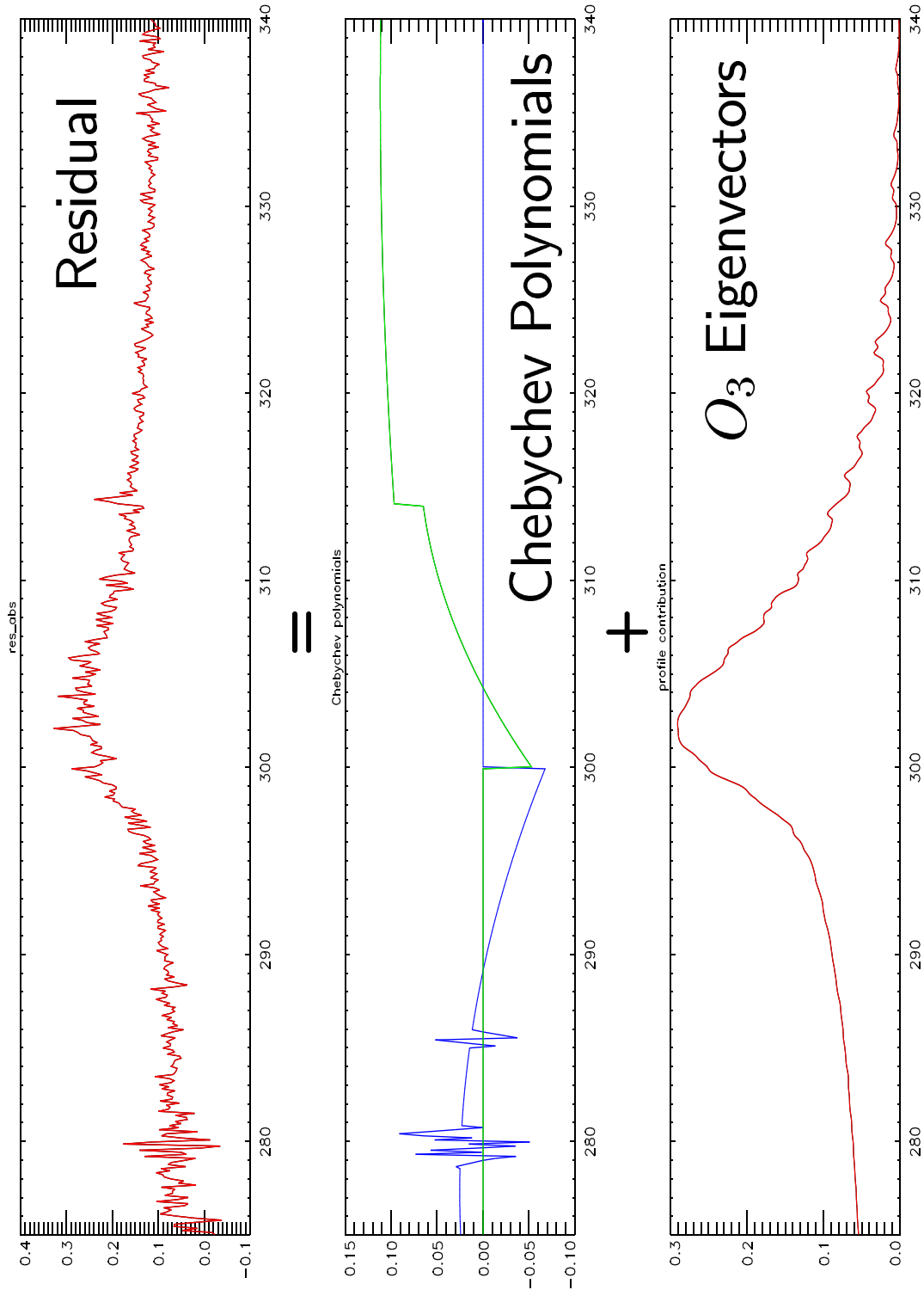
Basic Problem

$$\|R_{mod}(\lambda, p_1, p_2, \dots) - R_{meas}(\lambda, \tilde{p}_1, \tilde{p}_2, \dots)\| \stackrel{!}{=} \min$$

- R_{mod} : Forward Model \rightarrow GOMETRAN/SCIATRAN
- p_i : atmospheric parameters $\rightarrow O_3, T, \text{Rayleigh Scattering}, NO_2, \text{Aerosols, Albedo}, \dots$

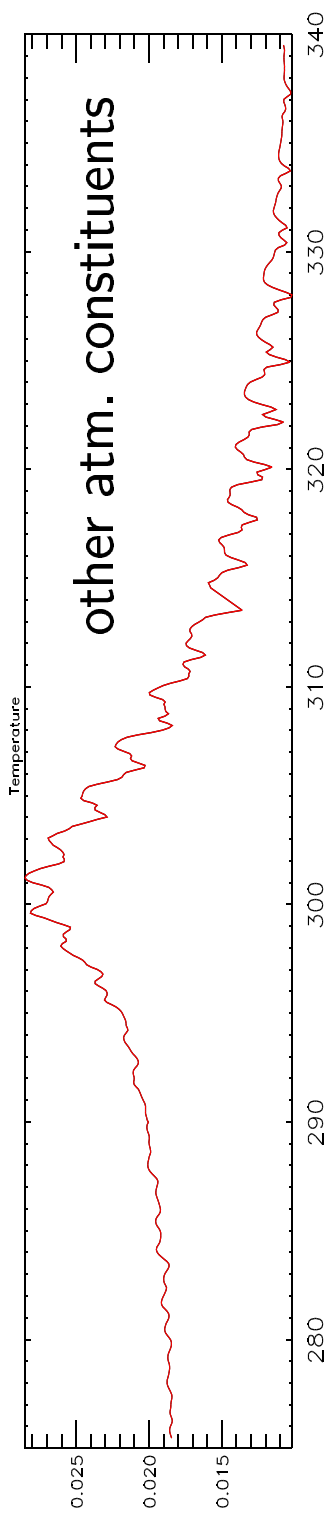
Difficulties:

- Problem is "ill-posed"
 - \rightarrow Advanced Optimal Estimation Method
- Calibration and Degradation Corrections
 - \rightarrow Chebyshev Polynomials and Dark current correction

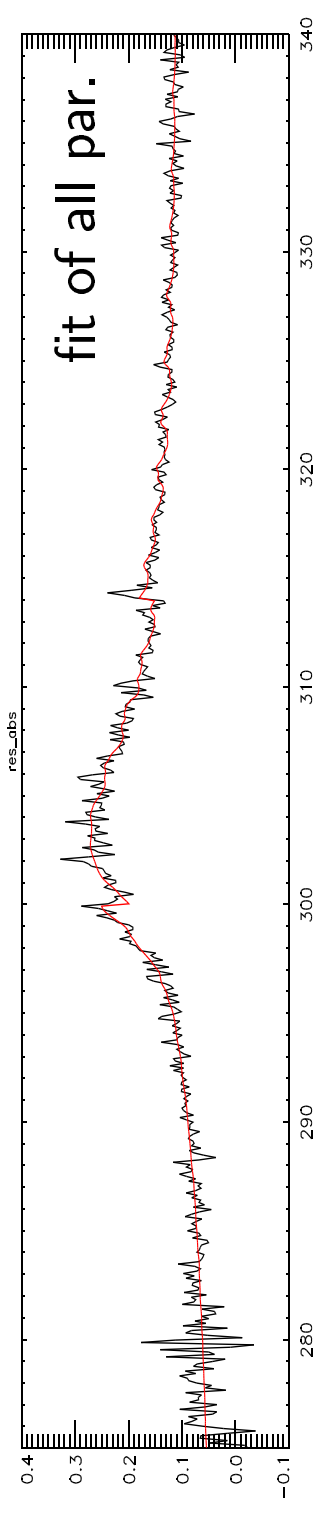




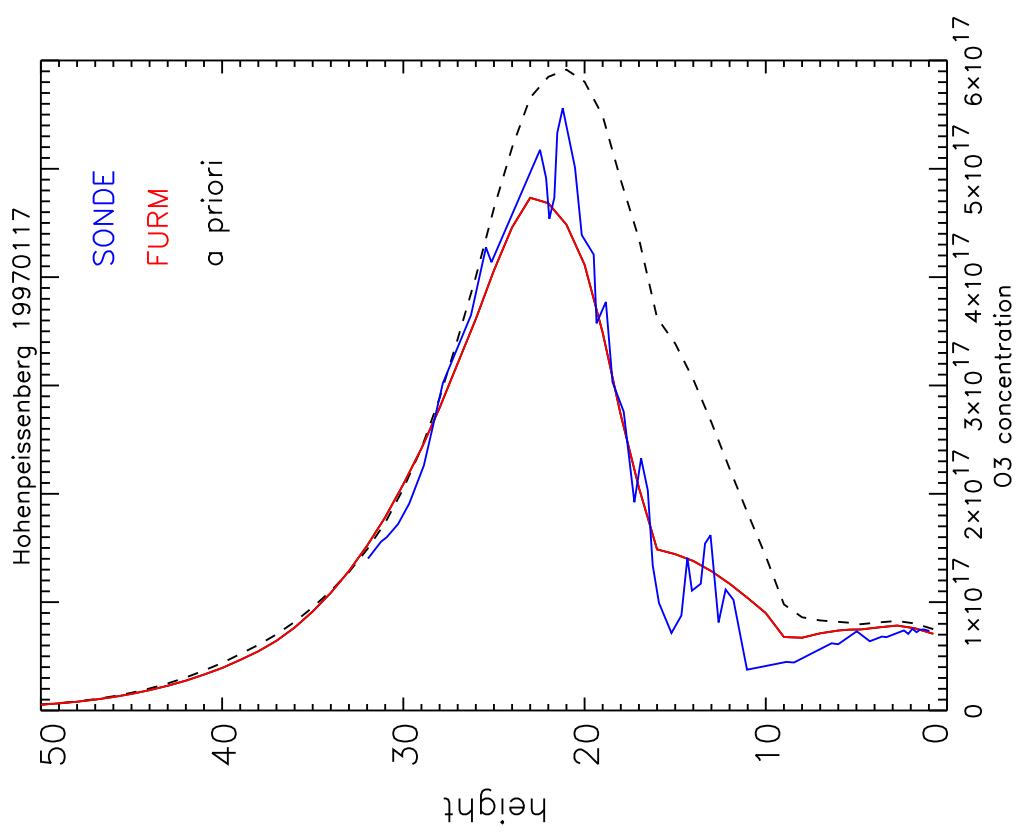
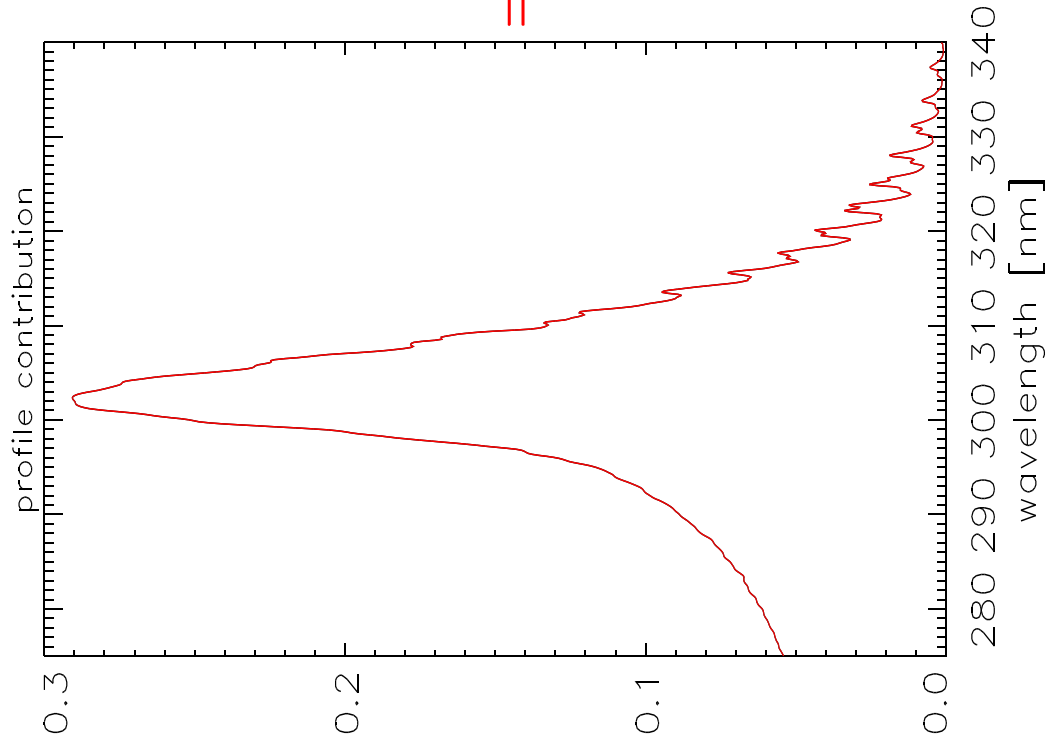
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⇒ Transformation of Ozone into height range





Summary & Outlook

- **Ozone Profiles can be retrieved from GOME with the FURM algorithm**
- **FURM can be applied to SCIAMACHY spectra in near future**
- **Requirement of correct calibration information**
- **near future : combination of nadir and limb scanning mode for profile retrieval**