The Radio Occultation Processing Package (ROPP)[1]

A software package to help prepare RO data for use in NWP data assimilation systems.

Maintained and developed by EUMETSAT's Radio Occultation Meteorology Satellite Applications Facility (ROM SAF).

ROPP MODULES

ROPP_UTILS

Low level service utilities
• QC and range-checking tools.
• ECI ↔ ECEF coordinate conversion routines.
• Geopotential ↔ geometric height conversion routines.
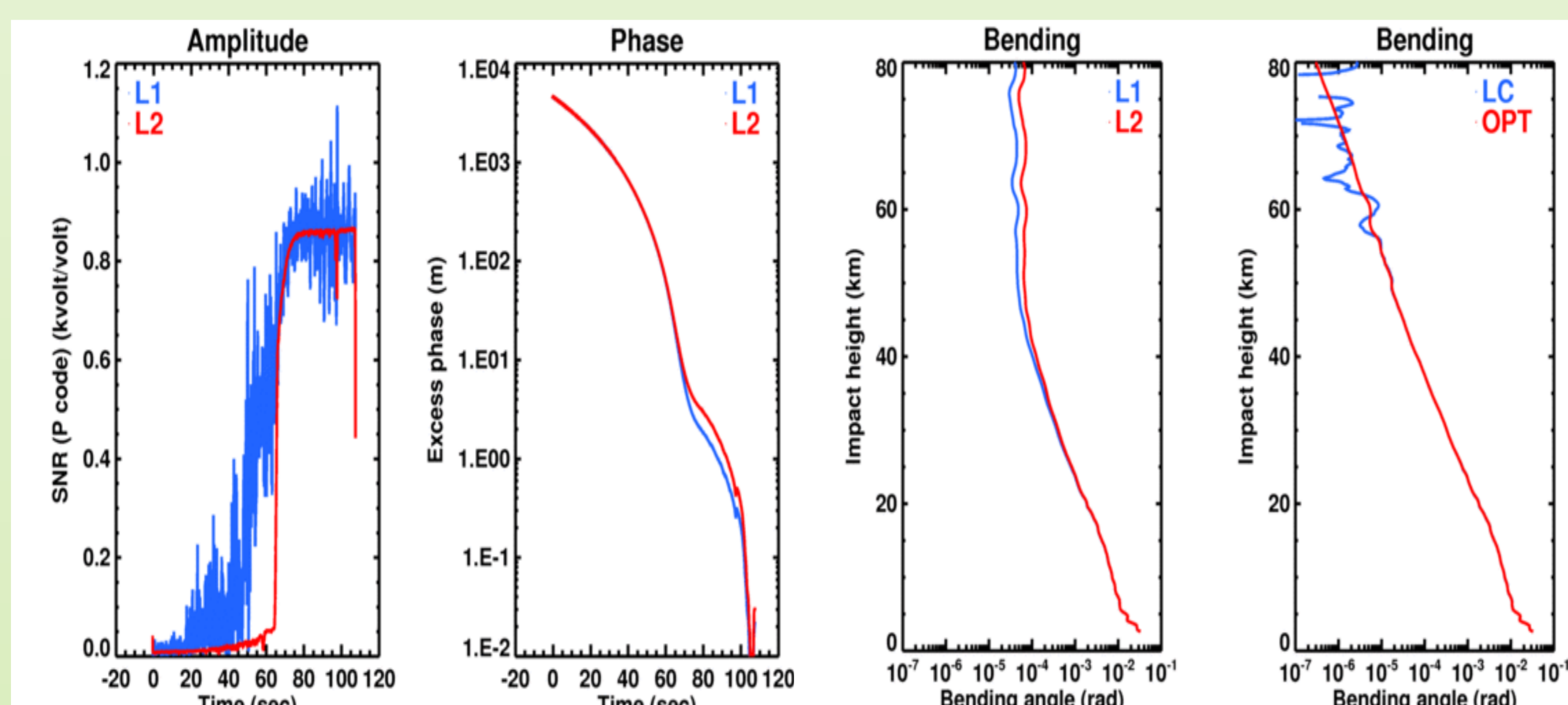• Date/time conversions.
• Unit conversions.

ROPP_IO

Support routines for reading and writing RO files
• Internal netCDF-based data structure.
• Read ROPP, BUFR, UCAR, GFZ, GRIB, EUM formats.
• Write ROPP, BUFR formats.
• Range- and unit-checking.
• Profile thinning algorithms.

ROPP_PP

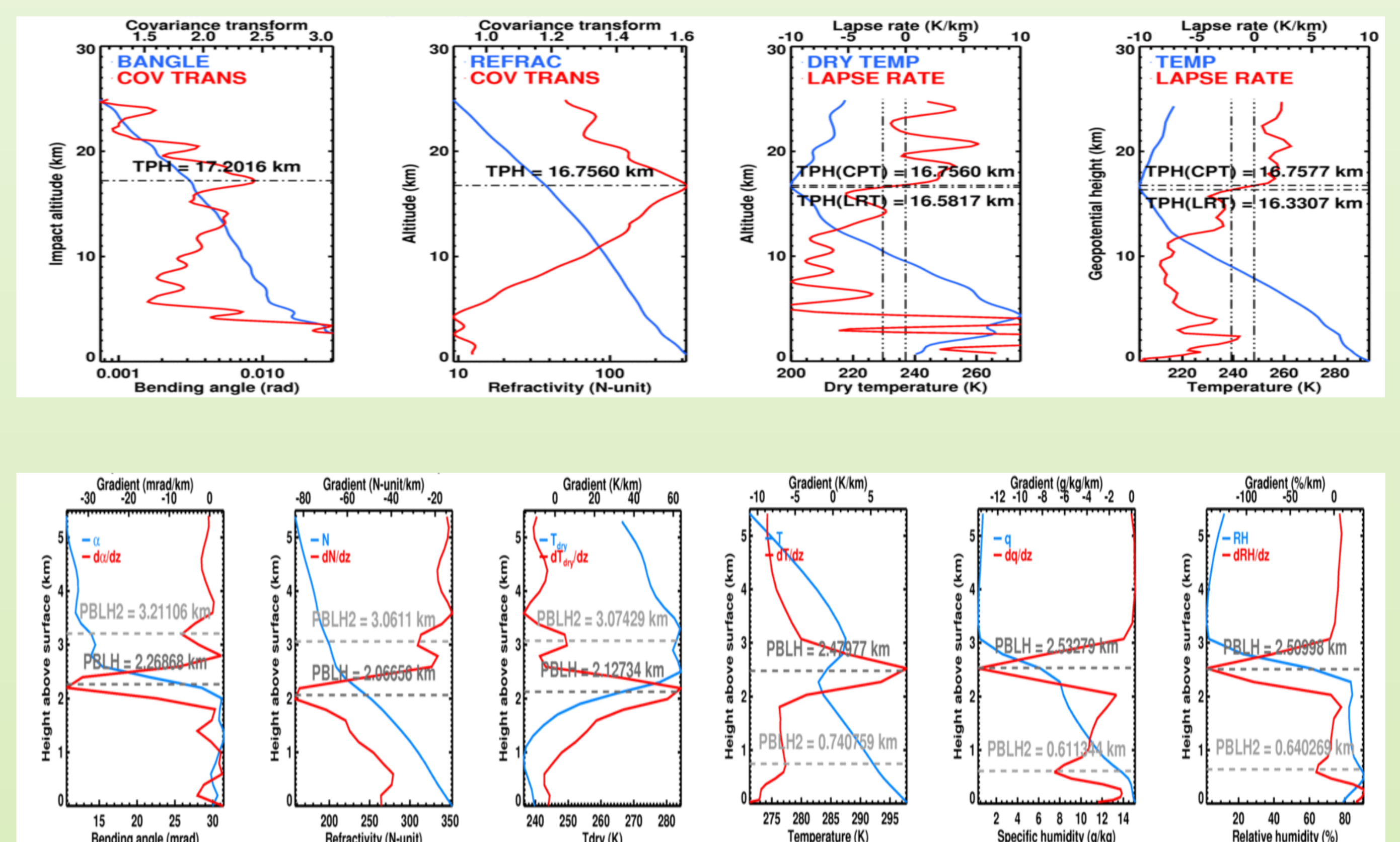**Pre-processor (converts excess phase to bending angle, refractivity and dry temperature)**
• Statistical optimisation.
• Ionospheric correction.
• Geometric and wave optics (CT2) processing.
• Wave optics propagator.
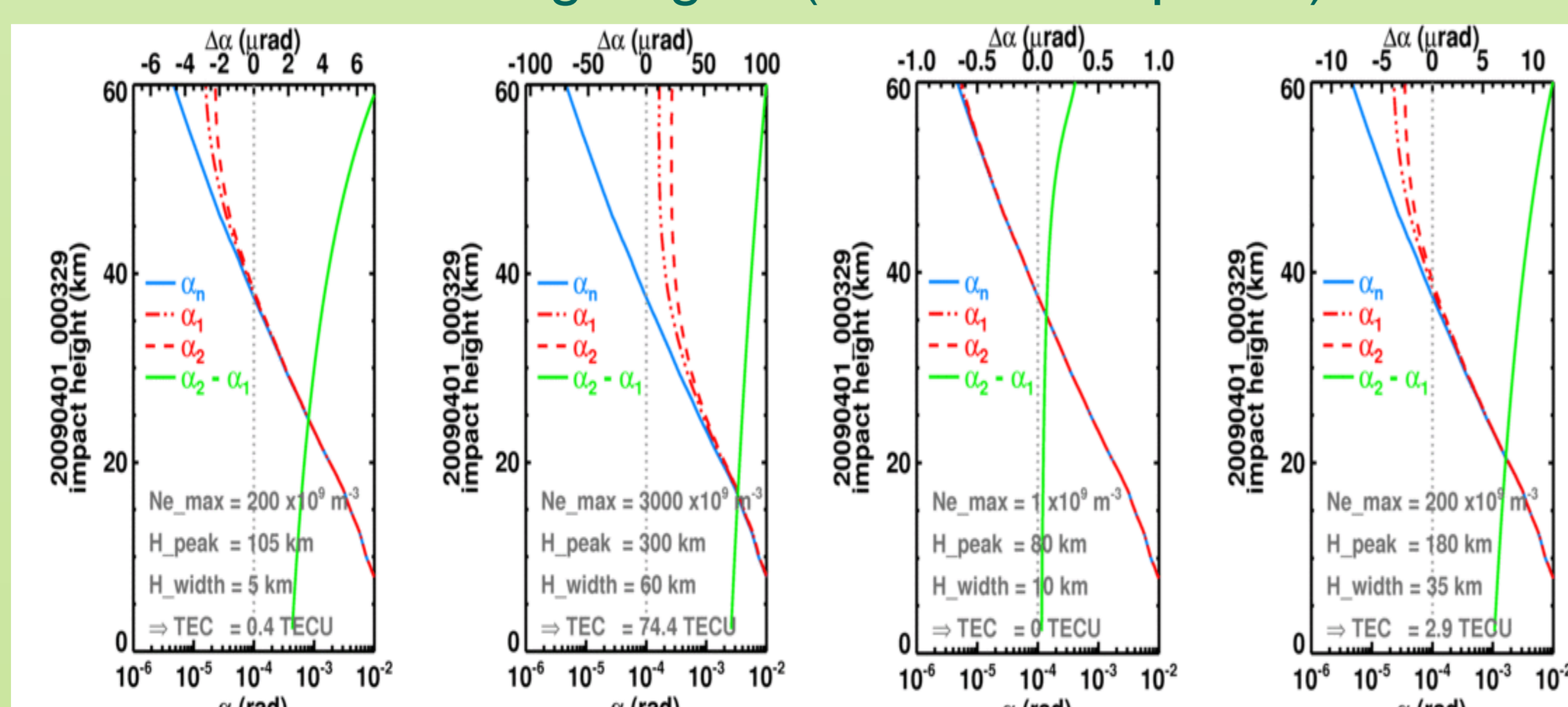

ROPP_APPS

Applications module
• Tropopause height diagnostics.
• Planetary boundary layer height diagnostics.

ROPP_FM

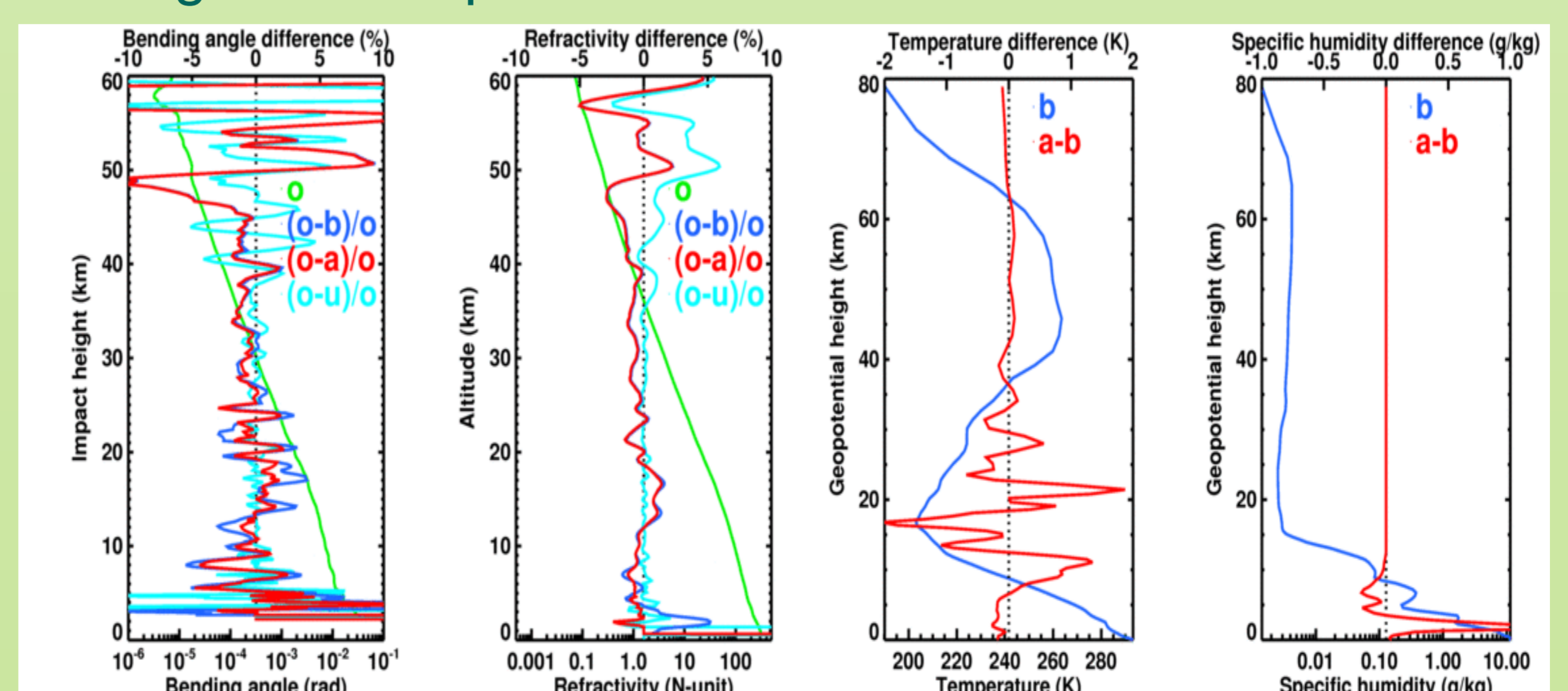**Forward models (compute refractivity and bending angle from background fields)**
• Forward operators, gradients, tangent linear and adjoint models.
• Supports hybrid-sigma (e.g. ECMWF) and geopotential (e.g. Met Office) based model levels.
• 2D bending angles.
• L1 and L2 bending angles (model ionosphere).

ROPP_1DVAR

1D variational retrieval of {p, q, T} using RO observables and model background data
• Can use refractivity or bending angle.
• Quality control.
• Two minimisation algorithms.
• Preconditioning.
• A variety of error covariance models.
• Diagnostic output.

To register and download the latest release of ROPP, please visit

http://www.romsaf.org

[1] Culverwell, I. D., Lewis, H. W., Offiler, D., Marquardt, C., and Burrows, C. P.: The Radio Occultation Processing Package, ROPP, Atmos. Meas. Tech., **8**, 1887-1899, doi:10.5194/amt-8-1887-2015, 2015.

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