

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

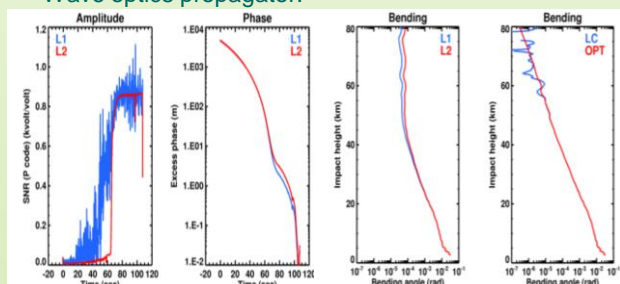
Support routines for reading and writing RO files

- 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)

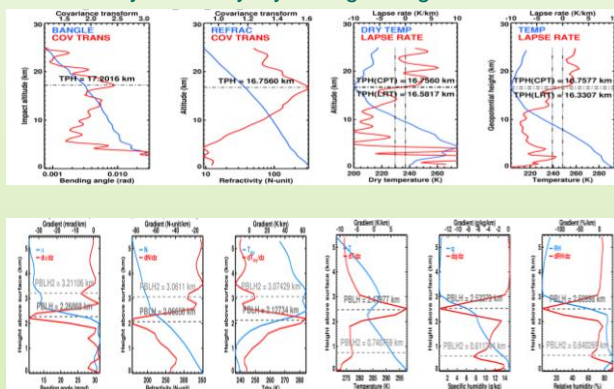
- Statistical optimisation.
- Ionospheric correction.
- Geometric and wave optics (CT2) processing.
- Wave optics propagator.



ROPP_APPS

Applications module

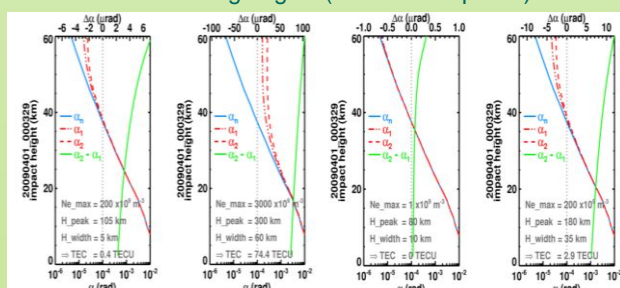
- Tropopause height diagnostics.
- Planetary boundary layer height diagnostics.



ROPP_FM

Forward models (compute refractivity and bending angle from background fields)

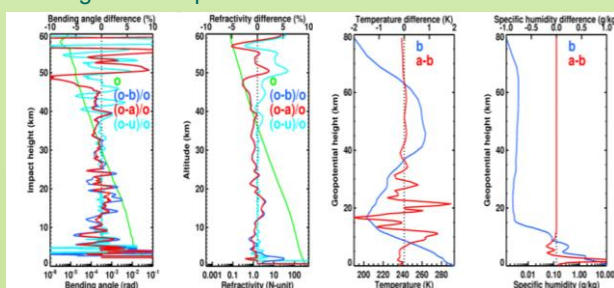
- Forward operators, gradients, tangent linear and adjoint models.
- Supports hybrid-sigma (e.g. ECMWF) and geopotential (e.g. Met Office) based model levels.
- 2D bending angles.
- L1 and L2 bending angles (model ionosphere).



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., Ofliler, 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.