



## International Polarized Radiative Transfer

### Case B2: Rayleigh scattering and molecular absorption

This test checks whether molecular absorption is correct. The setup is the same as for case B1 but with molecular absorption and at a different wavelength.

#### Setup:

- model atmosphere with 30 layers, scattering optical thicknesses provided in `tau_rayleigh_325.dat`, absorption optical thickness in `tau_molabs_325.dat`
- wavelength: 325 nm
- Rayleigh depolarization factor: 0.03
- surface albedo: 0
- output altitudes: 0 km, 1 km, 30 km
- sun position ( $sza=60^\circ$ ,  $saa=0^\circ$ )
- viewing zenith angles:
  - at 0 km :  $vza$ :  $0^\circ - 85^\circ$ ,  $5^\circ$  increment
  - at 1 km:  $vza$ :  $0^\circ - 180^\circ$ ,  $5^\circ$  increment (without  $90^\circ$ )
  - at 30 km:  $vza$ :  $95^\circ - 180^\circ$ ,  $5^\circ$  increment
- viewing azimuth angle  $vaa$ :  $0^\circ - 180^\circ$ ,  $5^\circ$  increment

#### Output format:

- The output should be provided in the same format as for case A1 (Rayleigh scattering).

### Results

Difference plots between the models IPOL, 3DMCPOL, SPARTA (previously named TROPOS), SHDOM, PSTAR and MYSTIC for the full radiation field:

3DMCPOL  
 .....  
 IPOL  
 .....  
 SPARTA  
 .....  
 SHDOM  
 .....  
 PSTAR  
 .....

Data of all models (MYSTIC and 3DMCPOL include also standard deviation):

MYSTIC  
 .....  
 3DMCPOL  
 .....  
 IPOL  
 .....  
 SPARTA  
 .....  
 SHDOM  
 .....  
 PSTAR  
 .....