A diagnostic equation for tendency of lapse-rate-tropopause heights

- A diagnostic expression for the tendency of lapse-rate-tropopause (LRT) height is derived by assuming that the LRT can be characterized as a discontinuity in the vertical gradient of the potential temperature.
- The derived equation is validated by examining the time variation of the LRT height associated with baroclinic waves in an idealized numerical calculation, that of the zonal mean LRT height in GPS radio-occultation data, and that of the LRT height in reanalysis data.
- In addition, the contribution from each term in the thermodynamic equation to the LRT height can be quantified. (Kohma and Sato, 2019, J. Atmos. Sci.)

Observed tendency of LRT heights   Estimated tendency of LRT heights