

# Towards Improved Representation of Stably Stratified Boundary Layers in NWP Models

## COSMO/DWD Contribution

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# COSMO/DWD Contribution

- Understanding essential physics: LES and DNS process studies (Mironov and Sullivan 2010, 2012, 2016; Sullivan et al. 2016; Sullivan and Mironov 2022)
- Turbulence modelling: Turbulence Kinetic Energy – Scalar Variance (TKESV) parameterization scheme (Mironov and Machulskaya 2017; Machulskaya and Mironov 2018, 2020)
  - Moist atmospheric turbulence
  - Coupling with statistical cloud scheme
  - TKE and TPE (turbulence potential energy) have equal rights
  - Careful treatment of pressure-scrambling effects (key point!)
  - Implemented into ICON, testing ongoing
- Modelling passive scalars: parameterization of passive-scalar fluxes consistent with the TKESV scheme (Mironov et al. 2022, in preparation)