

# Priority Task – TERRA Stand Alone

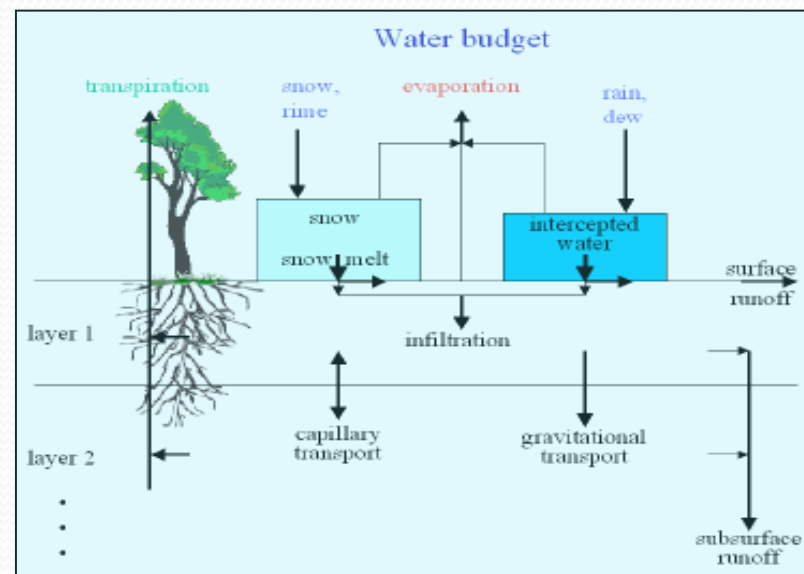
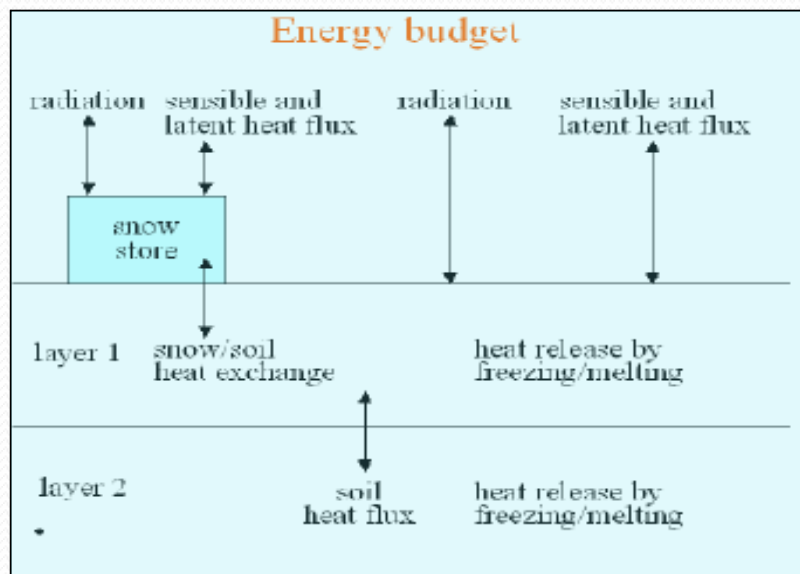
Task Leader: Yiftach Ziv (IMS)

Goal: Bring TERRA Stand Alone (TSA) source code up to date with COSMO last version in both aspects of physical schemes and coding standards.

0.4 FTE

# TERRA Stand Alone (TSA) – what is it?

- Decoupled version of the soil module of COSMO (TERRA)
- 1 dimensional
- 7 soil layers, max depth: ~21 metres (constant temperature).
- Calculate heat and moisture transfer in the soil and surface
- Boundary conditions from atmospheric analysis fields.



## TERRA Stand Alone (TSA) – what is it good for?

- Efficient multi-years soil spin-up.
- Efficient experiments with different soil parameterizations.
- Capability to isolate soil related problems without the complex interactions of a full 3D model.
- Hydrology and agriculture applications.

## Priority Task TSA

- **Task1: Consolidation of TSA Source Code**

**Deliverables:** Mapping and prioritizing discrepancies in all aspects between TSA and latest COSMO TERRA module and a rewrite of the code accordingly.

- **Task2: Review and Possible Revision of the Transfer Scheme implemented in TSA.**

**Deliverables:** Comparison of different transfer schemes and decision about implementation of an enhanced transfer scheme to TSA.

- **Task3: Estimating Spin-Up Time of TSA**

**Deliverables:** Defining TSA spin-up time.

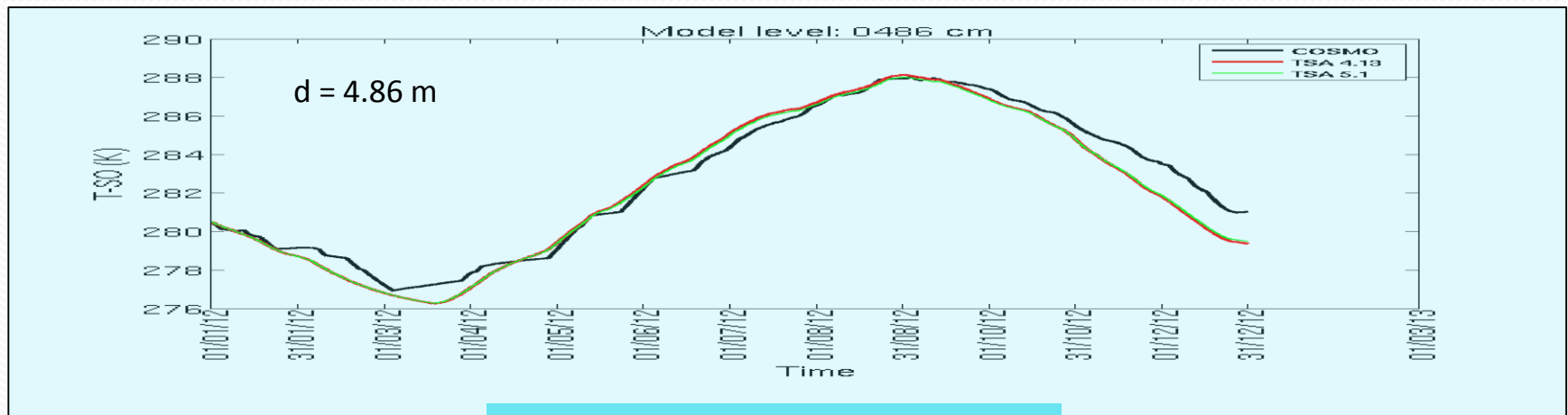
- **Task4: Verification of TSA and COSMO TERRA vs. observations**

**Deliverables:** Report on skill scores for TSA and COSMO-TERRA and on TSA limitations.

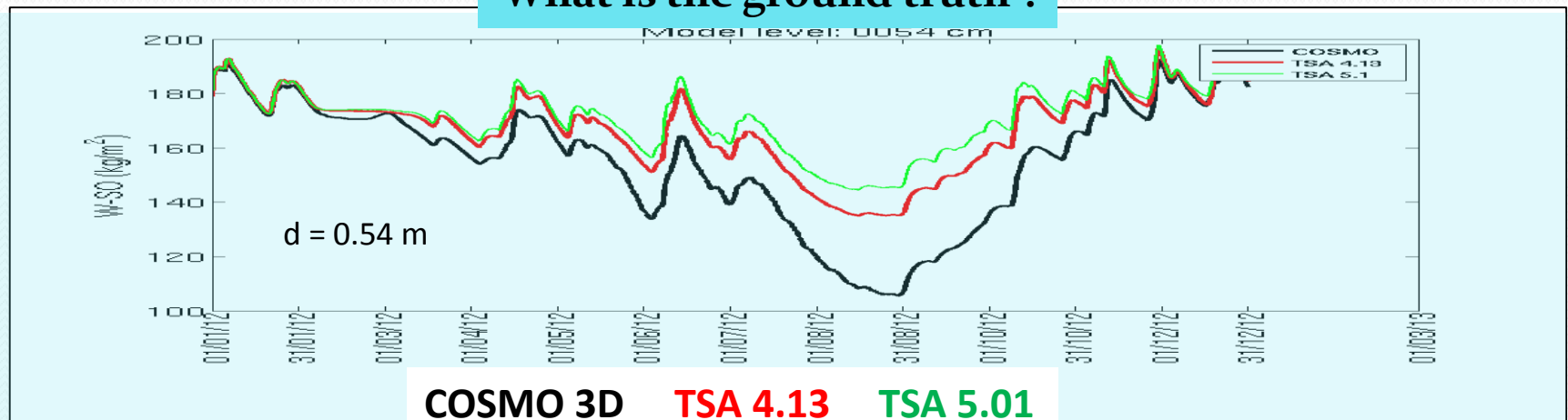
- **Advising:** J.M. Bettems (MeteoSwiss, WG3b); M. Raschendorfer (DWD, ConSAT); P. Khain (IMS)

# TERRA Stand Alone (TSA) – current state

- Old Louis Scheme for calculating the vertical eddy fluxes.
  - Verification required - TSA vs. TERRA and vs. observations



What is the ground truth ?



COSMO 3D    TSA 4.13    TSA 5.01



# TERRA Stand Alone (TSA) – uncertainties

- Updating the transfer scheme with the new turbulent diffusion (TURBDIFF from ConSAT)?
- Could the TSA functionality be integrated in to the operational code with a new switch?
- Building a new ground truth test site or using SwissSMEX, Lindenberg Meteorological Observatory

