Surface assimilation (I): soil temperature and moisture

Deep soil temperature and moisture

- 2m temperature and relative humidity measurements through Optimal Interpolation (CANARI / OI_main) or through Extended Kalman Filter

Superficial soil moisture

- Satellite measurements (ASCAT, AMSR-E/Aqua) – EKF
- Spatialization?

Surface assimilation (II): snow and ice

Snow depth

From SYNOP snow depth (height) reports through OI

- Difficulty distinguishing between 0 cm of snow and no report of snow height
- Problem of isotropic structure functions in mountaineous terrain

Snow extent

- Derived snow mask from satellite imagery and some arbitrary algorithmics (removing snow, adding 10 cm of snow where there is no snow in the model, etc.)

Snow density

- Specialized measurements (only campaigns ?) OI?
- Through albedo of snow ?

Surface assimilation (III): parameters !, not prognostic variables

Not really assimilation,

but rather using „values of the day“

SST, sea ice

- Satellite derived products – NESDIS SST, OSI SAF …

Albedo

- Albedo from LandSAF with simple KF

LAI, vegetation fraction

Probably similar to albedo ?