

New implementations available in SURFEX V9

- Scientific implementations
 - Explicit Light Absorbing Impurities
 - ESCROC (Multiphysics)
 - SYTRON (Blowing snow)
 - MEPRA (Mechanical stability)
 - Coupling with MEB (snow under forest)
 - Crocus-RESORT
- Technical implementations
 - More correct radiation parameterization on slopes (LSLOPE)
 - Complementary metadata for topographic-based geometry (LWRITE_TOPO)

Works in progress (for after V9)

- **Data assimilation** for Crocus in **SODA** (PhD B. Cluzet 2017-2020)
 - Algorithm : particle filter (local or with localization)
 - Variables : visible and NIR reflectances, snow depths, wet snow product, ...
 - Possible combination with EnKF for Snow Cover Area (?)
- Consolidation of MEB-Crocus coupling (PhD project 2019-2022)
 - Parameterizations of **intercepted snow**
- Numerical **optimizations** in Crocus : (R. Nheili 2019)
 - Improvement of vectorization (less « IF » when possible)
 - Analysis of optimal solution for loops layers/points, not obvious !
 - Spectral resolution of TARTES optical scheme
 - ▶ Required for **future operational system** for avalanche hazard forecasting (ensembles, high resolution, reflectances DA)
 - ▶ Required for an increasing use in **coupled mode**

Other works planned on the CEN prospective

- Parameterization of blowing snow on 250-m grid
 - Introduce MPI communications
- SODA : Data assimilation combining meteorological and snow observations ?
- Possible refinements of some processes in the snowpack (??)
 - New options in multiphysics (initial SSA ? Wet snow metamorphism ?)
 - Compaction due to metamorphism if inputs from the microstructure team
 - Liquid water percolation based on Richards equations ???