

## **Overview of main code modifications described in the article "Parametrisation of the variety of human behaviour related to building energy consumption in TEB (SURFEX v. 8.2)"**

We attach an archive containing the routines corresponding to SURFEX-V8.0 (SURFEX\_V8.0\_FOR\_GMDD.tar.gz) as well as the routines containing the modified code discussed in the present article (MODIFIED\_FOR\_GMDD.tar.gz).

The main scientific modifications of the TEB equations described in the present article are the following:

- The control of building occupation, design temperature for heating (Equation 24) and air conditioning (Equation 25), internal heat release (Equation 26), shading (Equations 27 and 28) and ventilation (Equations 30 and 31) availability can be found in "teb\_garden.F90" and its subroutine "bld\_occ\_calendar.F90".
- The computations related to reflection and absorption of solar radiation can be found in "urban\_solar\_abs.F90" and its subroutine "window\_shading.F90" (Equations 18, 19 and 29).
- In "teb.F90", the building energy model BEM is now called for N fractional uses and behaviours, the waste fluxes of heat and moisture are then aggregated over the N fractions (Equations 20 to 23). Also, the computation of the indoor radiative exchange coefficient (Equation 5), the indoor mean radiative temperature (Equation 6) as well as the computation of the indoor heat loads (Equations 13 to 17) is made here.
- The computations related to the convective (Equations 2 to 4) and radiative (Equations 7 to 12) exchanges between indoor air and facets can be found in "roof\_layer\_e\_budget.F90", "wall\_layer\_e\_budget.F90", "floor\_layer\_e\_budget.F90", "mass\_layer\_e\_budget.F90" and "window\_e\_budget.F90".
- The computations related to the Building Energy Model can be found in "bem.F90" (Equations 32 to 42).

Apart from the modifications of the TEB equations, various technical changes related to the treatment of model input parameters related to building use and human behaviours are made. The computation of the fractional design temperature for heating (Equations 47 to 49) and the interpolation of the internal heat release (Equation 50) as a function of the behavioural indicators described in Section 3 of the manuscript can be found in "ini\_data\_param\_teb.F90". However, contrary to the modifications of the model equations, which are applicable universally, this setup is hardcoded for applications in France and the data on building use, behaviour and architecture we use for France. A different configuration will have to be chosen for other countries and climatic regions.