

TEST 1

This unit test aims to decouple the phase-field evolution equation from the temperature equation and test if the phase-field equation evolves correctly in a planar setting. This basic aim can be summarized as:

1. Check whether inputs are read correctly by checking input.in and the corresponding output.in in the output folder.
2. Check if the Filling Algorithms are working correctly such as Fill_Cube and Fill_Constant.
3. Plot the output phi.vtk files in paraview to see phase-field profile varies smoothly over time.
4. The phase-field profiles should remain stationary (since the driving force terms would be switched off).
5. The temperature field should not evolve over time as it is initialized to a constant value.

The test1_input.in contains the keys to run and implement the unit test. Some important points that warrants attention are as follows:

1. To switch off the driving force terms in the phase-field equation select
gamma = 0.0;
alpha = 0.0;
2. Switch-off the noise term by setting **a = 0.0;**
3. Switch-off the anisotropy term by setting **delta = 0.0;**
4. Switch-off the coupling term in temperature equation by setting **K = 0.0;**
5. Fill half square domain by value of phi = 1 and phi = 0 by invoking
Fill_Cube = phi,1.0,0.50,0.100;
6. Fill the entire domain by a constant value of temp field as
Fill_Constant = temp,0.0;
7. Additionally, set **T_e = 0.0** (or the same constant value set in Fill_Constant).
8. Rest of the keys can be found in the input file.

The plots are presented in the output folder, where the solution passes the tests 1-5 stated above.