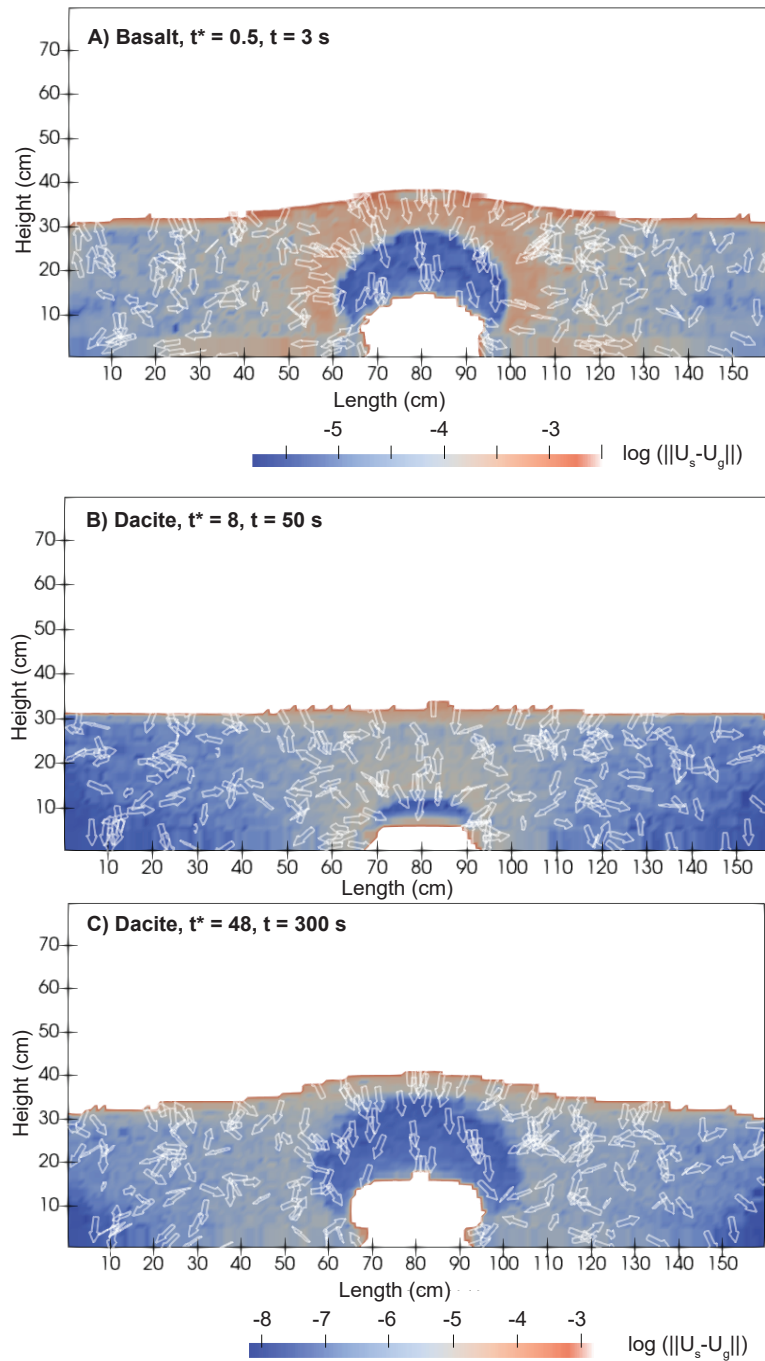


Supplementary Information 2:



Supplementary Figure S1: Cross sections at mid-thickness ($z=2.5$ cm) of relative velocity distribution. The relative velocity is the solid velocity averaged over one fluid cell minus the fluid velocity of that cell. Relative velocity direction is given by 3D white arrows (note how some arrows do

not point in the x - y plane of the cross section). The color gradient indicates the relative velocity magnitude in log units of m/s. A) Run A at $t^*=0.5$. B) Run B at $t^*=8$. C) Run B at $t^*=48$.