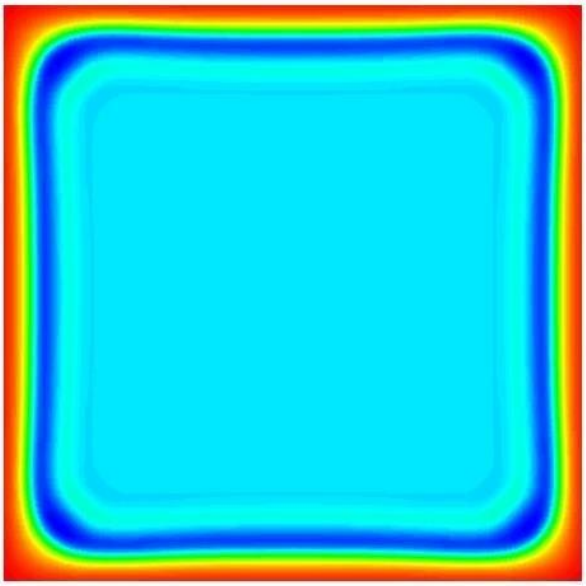
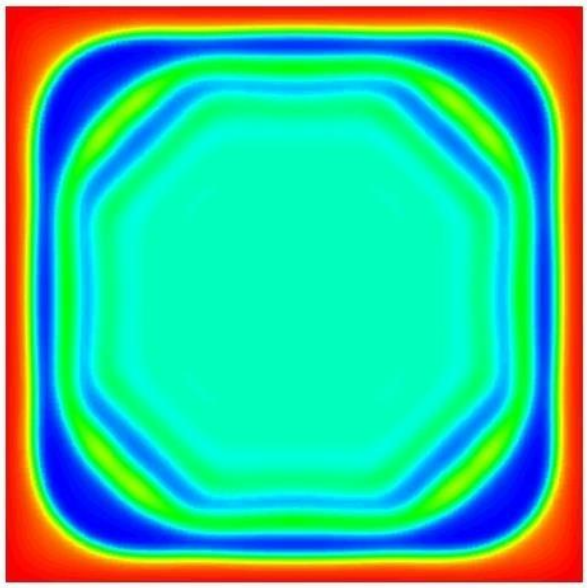
**ADIABATICALLY INDUCED SPINODAL DECOMPOSITION**
**ARCOFLUID**

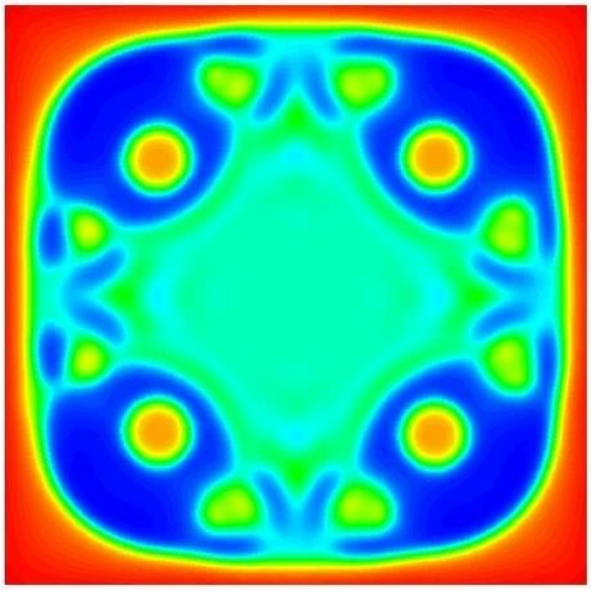
From the dynamic van der Waals theory of Onuki (PHYSICAL REVIEW E **75**, 036304 _2007) starting with entropy and energy functional with gradient contributions. The resultant hydrodynamic equations contain the stress arising from the density gradient. It provides a general scheme of two-phase hydrodynamics involving the gas-liquid transition in non-uniform temperature. Some complex hydrodynamic processes with evaporation and condensation are examined numerically. We have looked first to adiabatically induced spinodal decomposition. Here after are results obtained through the numerical simulations of the Korteweg equations.



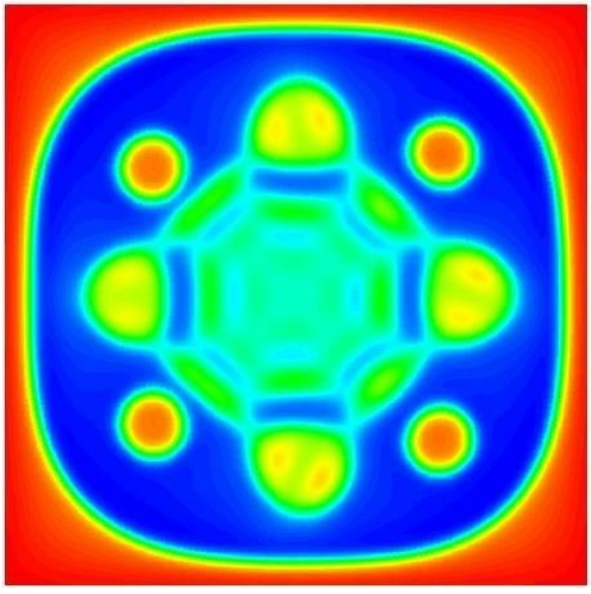
t/t0=500



1000



1500



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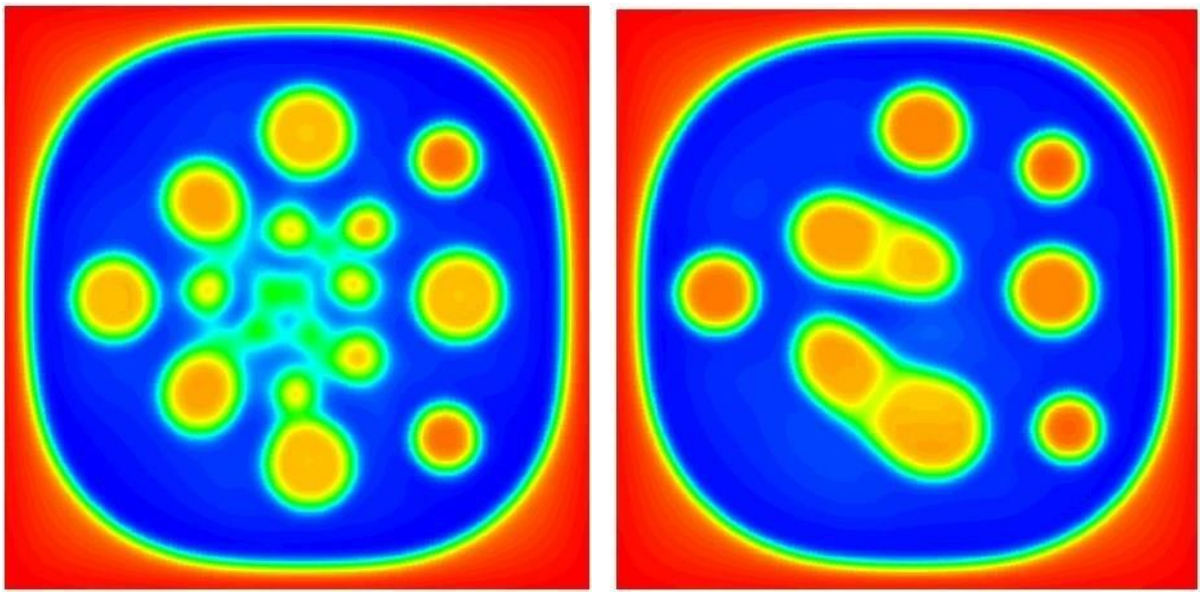
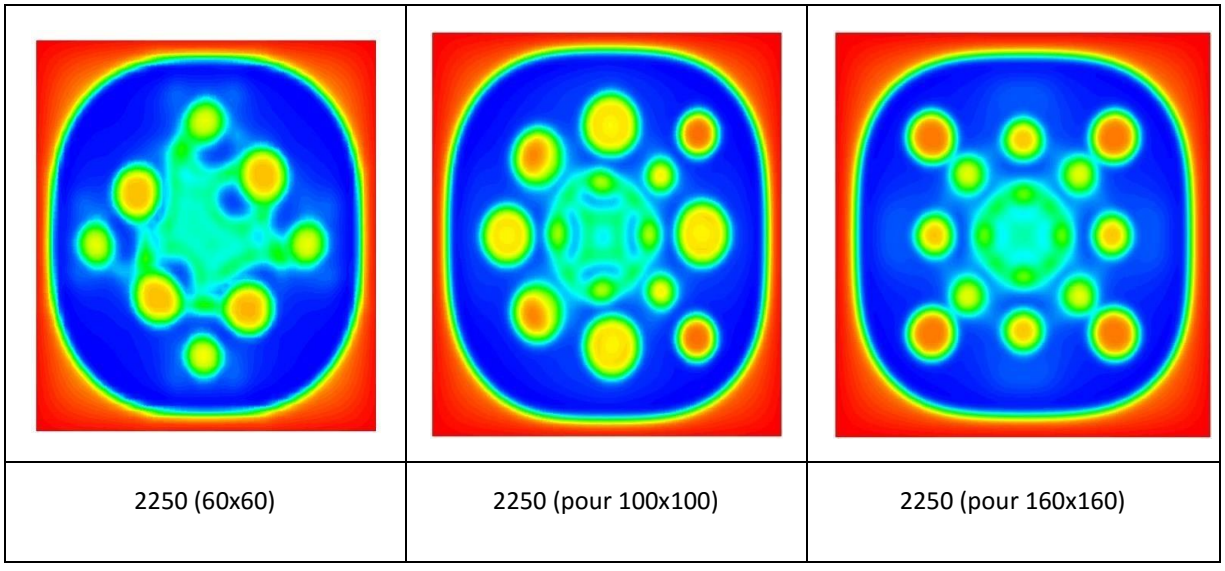


2500 3000

Fig. 1 Density profiles in phase separation after lowering of the boundary temperature from 1.1*Tc* to 0.91*Tc* at *t*=0. Here the liquid layer in red at the boundary acts as a piston adiabatically expanding the interior. Dimensionless time is given in all figures.



| 2250 (60x60) | 2250 (pour 100x100) | 2250 (pour 160x160) |
|---|---|---|

Fig. 2 Comparison of the above case for three different set of finite volumes mesh (60x60, 100x100, & 160x160). At dimensionless time 2250, the symmetry is preserved longer as the number of cells increase.