

## Derivation of a two-phase flow model with surface tension

*Tuesday, December 13, 2022 4:45 PM (45 minutes)*

This talk deals with the derivation of a compressible two-phase flow model by means of the Least Action Principle (LAP).

The key point of this method is to provide an appropriate Lagrangian functional which depicts the behaviour of the fluid system.

It is composed of a kinetic energy, taking into account small scales features, and a potential energy.

The latter corresponds to the thermodynamical energy of the system whose derivation will be detailed.

To do so the interface separating the two phases is supposed to be sharp, with no mass, but it has a temperature.

In other words, the interface is depicted by its own internal energy, satisfying a Gibbs differential form involving surface tension.

Applying the LAP gives a partial differential equations describing the compressible behaviour of the fluid-interface system.

To finish some properties of the model will be analysed (hyperbolicity, dissipation...).

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