

# M2R stage proposition:

## numerical modeling of ink jet printers

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Ink jets are commonly used by printers, associated to computers, but also on postal packages or in food industry, for instance for the date on the eggs. One of the major difficulty is to break the ink jet into small droplets that are then deviated in an accurate way, in order to write on a surface, as pixels on a screen.

The stage aims at understanding how the ink jet breaks into droplets (see Figure). The main idea is to develop a full numerical model of the fluid and its interface by a level set method, combined with mesh adaptation. The code will bases on the C++ finite element library Rheolef (free software, GPL licence). Then, using the simulation as a predictive tool, the effects of each physical parameters will be explored in order to determine the range where the ink jet correctly breaks into droplets.

In collaboration with the Markem-Imaje/Dover compagny, in Valence (France, Drome), this stage is proposed by the lab. Jean Kuntzmann and the laboratoire de Rhéologie et Procédé, both in Grenoble.

**Keywords** : Numerical modeling, partial differential equations, level set method

**Location** : laboratoire LJK, university of Grenoble.

**Remuneration** : about 600 euros/month.

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