

Post doctoral position at
“Laboratoire des Matériaux et Structures du Génie Civil”
Paris, France, June 2004 => June or December 2005

“Fast quantitative NMR imaging of pasty materials under transient deformations”

In order to study transient non-viscometric flows of pastes (extrusion, intrusive flows, squeeze flows, slump test for fresh concrete, etc) of interest in various industries (ceramics, drilling mud, cement, foodstuffs, etc) we develop corresponding experiments within a proton Magnetic Resonance Imager.

Our 20MHz proton imager (Bruker Avance system, vertical, 0.5T, 40cm bore) is already equipped with a large size rheometer (12 cm outer diameter for Couette cells). Our laboratory has a 4 years experience in the measurement of steady or slow varying velocity fields inside this rheometer. Soon, our MRI will be also equipped with a triaxial device in order to study plastic deformations in different kind of pasty and solid systems.

The Post-doctoral research will focus on the development of MRI sequences capable to measure ‘snap shot’ information about velocity field into the sample during unsteady, transient deformation. The goal of such work will be to get as quantitative information as possible about the flow in specific experimental situations. The candidate will be free to propose his own imaging approaches (1D, 2D, 3D, phase coding, spin tagging, multi echo imaging, ...). One part of the work will also consist in determining a pasty system with good NMR characteristics in order to test the methodological developments.

This work will be held at LMSGC (20km east from Paris, France), inside the NMR team, and with strong connection with the rheology team of the lab.

The candidate should have a good knowledge of MRI techniques. A first experience in the design and the programming of NMR sequences is required, in the domain of MRI or in the more general domain of ‘gradient’ NMR. Some skills in data processing and computer programming will also be necessary. Although not absolutely required, some basic knowledge about solid or fluid mechanics will be appreciated.

Practical information :

Contract duration : 12 month minimum, 18 months maximum, starting 1st of June 2004

Income : 2150€ / month, before taxes

The candidate should have a PhD degree or any degree on equivalent level.

Dead-line for contacting the lab and providing documents : end of March 2004

If you wish to apply for this position, documents required before end of march 2004 :

- detailed Curriculum Vitae
- copy of PhD diplom (or equivalent diploma), including report of defence and report from referees (in case of PhD).
- List of publications
- Description of the scientific project
- Short description of his professional plans after this post-doctoral position

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