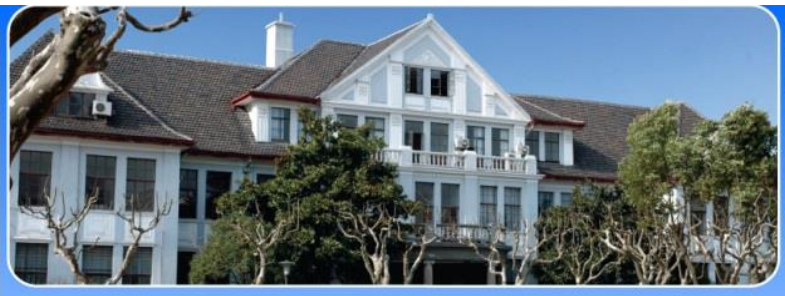


# 复旦大学数学科学学院
# 数学综合报告会

报告题目：**An Energy Preserving Monolithic Eulerian Fluid-Structure Finite Element Method**

报告人：Olivier Pironneau

(Sorbonne University, UPMC(Paris VI), Laboratoire Jacques-Louis Lions.）

报告时间：2016-11-04 星期五 10:00

报告地点：光华东主楼 1801

摘要： When written in an Eulerian frame, the conservation laws of continuum mechanic are similar for fluids and solids leading to a single set of variables for a monolithic formulation; the only difference is in the expression of the stress tensors. Such monolithic formulations are well adapted to large displacement fluid-structure configurations, but stability is a challenging problem because of moving geometries.

In this talk the method and its discretization are presented, stability is discussed for an implicit in time finite element method in space by showing that energy decreases with time. The key numerical ingredient is the Characterics-Galerkin method coupled with a powerful mesh generator.

A numerical section discusses implementation issues and presents a few simple tests.
We will also present an numerical implementation of the same with contact where the variational inequality is solved by the semi-smooth Newton method.

The case of a ball drop in a fluid with rebound at the bottom will be simulated in 2D.

非线性数学模型与方法教育部重点实验室
中法应用数学国际联合实验室
上海市现代应用数学重点实验室
复旦大学数学研究所