

Research Topic for the Arts et Métiers ParisTech - CSC PhD Program

Subfield: Applied Physics, Fluid Mechanics, Biomechanics

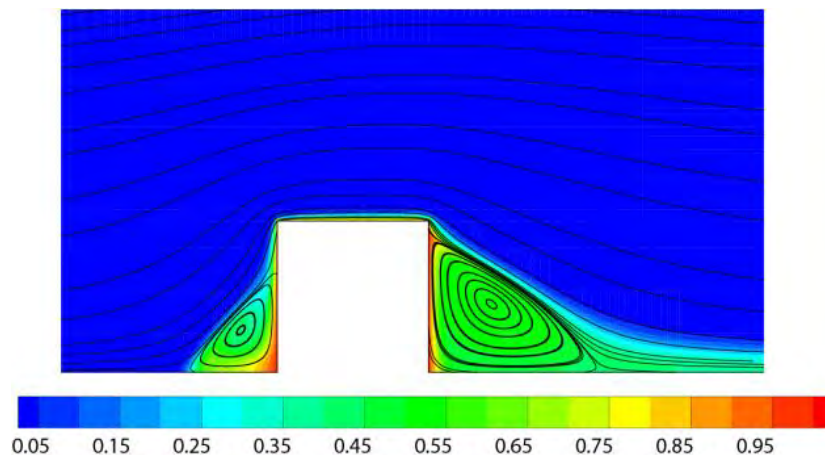
ParisTech School: Angers/Paris

Title: Experimental investigation of the coupling between the mass transfer and hemodynamics

Advisor(s): A. Ambari, S. Champmartin, C. Sarraf
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Short description of possible research topics for a PhD: (10 lines in English + optional figure)

The cardiovascular diseases are one of the main causes of morbidity and mortality in the western countries. Drug eluting stents are now commonly used to address these problems but some questions remain unanswered about the mass transfer in such complex systems. In the present research project, we want to study experimentally the mass transport phenomenon in a bare, stenosed and stented artery. The candidate will design a new setup using the polarographic technic to elucidate the coupling between the pulsatile flow of blood and the mass transport from an eluting surface in the liquid (blood) and the solid (artery wall) media. These experimental results will be compared to some numerical data previously obtained.



Numerical concentration distribution near a stent strut

Required background of the student: the applying student must have a good background in Theoretical and experimental Fluid Mechanics, Mass Transfer

2-3 representative publications of the group:

F. Chabi, S. Champmartin, C. Sarraf and R. Noguera, Critical evaluation of three hemodynamic models for the numerical simulation of intra-stent flows, J. of Biomechanics 48(10), 2015

El Baroudi, F. Razafimahery and L. Rakotomanana, Fluid–structure interaction within three-dimensional models of an idealized arterial wall, International Journal of Engineering Science 84, 2014

FOR APPLICATION, PLEASE CONTACT ADVISOR(S) BY EMAIL WITH COPY TO:
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