

Some collaborative research projects at Cemosis: Methods and Applications (salle 1)

vendredi 4 décembre 2020 09:00 (45 minutes)

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Président.e de session : Laetitia Giraldi

Modérateur.trice : Matthieu Aussal

Cemosis is the platform for mathematical collaboration at the interface with companies and other disciplines. Collaborative research projects are essentially between mathematics and physics and health. Recently, we had the opportunity to start new collaboration in environmental sciences.

In this talk, after a brief presentation of Cemosis, I will present briefly the context of three applications: (i) in health with the eye2brain project in collaboration with U. Descartes, U. Missouri, INRIA and Politecnico di Milano; (ii) and the swimmer project in collaboration with INRIA and UPMC (iii) in physics with the high field magnet project in collaboration with the National Lab for High Magnetic Fields; (iv) Then, for each project, I will present the mathematical models and numerical methods and some of the results obtained so far.

Finally, if I have the time, I will present the more recent IBat project, in environmental sciences, in collaboration with the company Synapse Concept and some first results.

From the modeling point of view, the presentation covers a wide range of problems, (Navier-)Stokes and Darcy flows, Heat and Moisture transfer, Elasticity and Maxwell as well as their coupling. From the methodological point of view, the presentation discusses the finite element method cG as well as hdG, fluid mechanics in moving domains with rigid bodies, PDE and ODE coupling and reduced order methods.

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