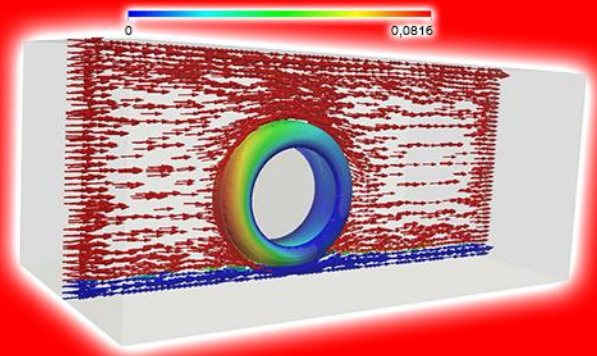


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# Séminaire du GIREF



## Space-time adaptation for reaction-diffusion systems

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**Date, heure et endroit**

Vendredi 15 septembre 2017  
PLT-2510  
14h30

### Résumé

Anisotropic residual error estimates for elliptic equations were introduced by M. Picasso in 2003 based on interpolation estimates by L. Formaggia and S. Perotto in 2001. Mesh adaptation is used to control the energy norm of the error by converting the estimator to a non-Euclidean metric defined on nodes. This talk concerns the extension of their methods to the nonlinear monodomain system, used for simulation of the action potential in cardiac electrophysiology. The system consists of a parabolic PDE representing the transmembrane potential, coupled with a system of first order ODEs for the recovery/gating variables. The recovery variables do not benefit from the smoothing properties of a diffusion operator, giving rise to numerical difficulties in the adaptation algorithm. In addition, the mesh adaptation will be coupled with an adaptive BDF2 method. The estimator for the time discretization error extends results for ODEs by G. Akrivis and P. Chatzipantelidis in 2010 to parabolic PDEs.



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