Optimal control in ferromagnetism: minimal time of magnetization switching

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In this talk, we consider an ellipsoidal ferromagnetic material exposed to an external magnetic field. The magnetization of the material is modeled by the Landau-Lifshitz equation. We are interested in the following question: can we reverse the magnetization of the material in minimal time by using the external magnetic field as our control variable? We prove that, depending on the material's ellipsoidal geometry, there is a threshold value for the magnetic field that allows reversal or not. This is a joint work with Raphaël Côte, Guillaume Ferrière and Yannick Privat.

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