

## On Optimal Stochastic Control in Ferromagnetism

Thomas Dunst, Ananta Kumar Majee, Andreas Prohl<sup>1</sup>, Guy Vallet<sup>2</sup>

### SUMMARY

I propose a model for optimal control of the stochastic Landau-Lipschitz-Gilbert equation governing ferromagnetism on domains  $D \subset \mathbb{R}^d$  ( $d = 1, 2, 3$ ) and show its solvability. For  $d = 1$ , Pontryagin's maximum principle is obtained via a convergent Galerkin approximation of the problem, which also provides the basis for computational studies which will be reported.

**Keywords:** optimal stochastic control, SPDE, Pontryagin maximum principle, simulation

**AMS Classification:** 93E20, 60H15, 82C80

<sup>1</sup>Department Mathematisches Institut  
University Universität Tübingen  
email: {dunst,majee,prohl}@na.uni-tuebingen.de

<sup>2</sup>Department Lab. Mathématiques et leurs Applications, UPPA  
University Université de Pau et des Pays de l'Adour  
email: guy.vallet@univ-pau.fr