

*Convergence analysis of a finite volume scheme for a stochastic  
Allen-Cahn problem*

**Aleksandra Zimmermann** (Institute of Mathematics TU Clausthal),  
Caroline Bauzet, Cedric Sultan, Guy Vallet

We address the convergence analysis of a numerical scheme for an Allen-Cahn problem with constraint and with a stochastic external force given by a multiplicative noise of Itô type. The problem is set up in a bounded spatial domain of dimension 2 or 3 and homogeneous Neumann boundary conditions are considered.

We propose a time-space discretization, of semi-implicit Euler-Maruyama type with respect to time and a Two-Point Flux Approximation (TPFA) with respect to space for a regularized version of the constrained problem. Under the assumption  $\Delta t = \mathcal{O}(\epsilon^{2+\theta})$  for a positive  $\theta$  on the time parameter  $\Delta t$  and the regularization parameter  $\epsilon$  we show the convergence our scheme towards the unique variational solution of the problem.

[\[link to pdf\]](#) [\[back to Numdiff-17\]](#)