



复旦大学数学科学学院 数学综合报告会

报告题目: **NUMERICAL APPROXIMATION OF THE DYNAMIC
GINZBURG-LANDAU EQUATIONS IN NONSMOOTH DOMAINS**

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摘要: We study the time-dependent Ginzburg-Landau equations (TDGL) in a polygon, possibly with reentrant corners. After proving well-posedness of the equations and decomposing the solution as a regular part plus a singular part, we see that the magnetic potential is not in H^1 in general, and so the standard finite element method (FEM) may give incorrect solutions. To overcome this difficulty, we reformulate the equations into an equivalent system of elliptic and parabolic equations based on the Hodge decomposition, which avoids direct calculation of the magnetic potential. The essential unknowns of the reformulated system admit H^1 solutions and can be solved correctly by the FEMs. We then propose a decoupled and linearized FEM to solve the reformulated equations and present error estimates based on the proved regularity of the solution. Numerical examples are provided to support our theoretical analysis and show the efficiency of the method.

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