# 数学与系统科学研究院

## 计算数学所学术报告

**报告人**： **Prof. Zhimin Zhang**

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**报告题目**：

# A new approach for solving the time-dependent Ginzburg--Landau superconductivity model

**邀请人**： 张文生 研究员

**报告时间**：2014 年 12 月 3 日（周三）
上午 **10:00-11:00**

**报告地点**： 数学院南楼七层 **702** 会议室

# Abstract：

We prove well-posedness of time-dependent Ginzburg--Landau system in a nonconvex polygonal domain, and decompose the solution as a regular part plus a singular part. We see that the magnetic potential is not in $H^1$ in general, and the finite element method (FEM) may give incorrect solutions. To remedy this situation, 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 proved regularity of the solution. Numerical examples are provided to support our theoretical analysis and show the efficiency of the method.

# 欢迎大家参加！