



复旦大学数学科学学院 数学综合报告会

报告题目: **Analysis and optimal control for some Cahn-Hilliard type systems modelling tumor growth**

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报告时间: 2018-03-14 星期三 10:00 - 11:00

报告地点: 光华东主楼 1801

摘要: A diffuse interface model of tumor growth proposed in [Int. J. Numer. Math. Biomed. Engng. 28 (2011), 3-24] consists of a Cahn-Hilliard equation for the tumor cell fraction coupled to a reaction-diffusion equation for a variable representing the nutrient-rich extracellular water volume fraction. Now, if we take an admissible variant of the system characterized by two further viscosity terms with small coefficients, the asymptotic analyses as such coefficients tend to zero turn out to be rather interesting. A distributed optimal control problem can be also addressed, in which the distributed control ξ plays in the right-hand side of the reaction-diffusion equation and can be interpreted as a nutrient supply or a medication, while the cost functional aims to keep the tumor cell fraction under control during the evolution. One can show that the control-to-state operator is Frechet differentiable between appropriate spaces and discuss the first-order necessary conditions of optimality. This talk is based on recent results jointly obtained with Gianni Gilardi(Pavia Uni.), Elisabetta Rocca (Pavia Uni.) and Juergen Sprekels(WIAS).

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