应用数学讲座

Научный Семинар по Прикладной Математике

Research Seminar on Applied Mathematics

应用数学报告（11）

报告人 / Докладчик / Speaker:
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题目 / Название / Title:
Unique reconstruction of sources in bioluminescence tomography

时间 / Время / Time：12 月 17 日 9:30-11:30 a.m.

地点 / Место / Venue: 数学中心会议室（主楼 336）

摘要 / Аннотация / Abstract:
In this talk, we consider inverse source problems arising in bioluminescence tomography (BLT). Mathematically, BLT is an under-determined inverse source problem which leads to no solution uniqueness. Particularly, one cannot distinguish between a strong source over a small region and a weak source over a large region. Therefore, it is particularly important to know the support Ω_s of the underlining light source p_* so that its strength could be reconstructed accurately. In the literature, Ω_s is assumed to be given. Practically, we only get an approximation Ω_a of it, known from some a priori information. The accuracy of Ω_a affects largely the one in approximate solutions of p_*. Therefore, a nonlinear functional is proposed and the problem is transferred to a minimization one. Also, a new time-dependent coupled model is proposed motivated by the solution uniqueness. Some numerical results are shown for the verification of the new model and methods. This is a joint work with Weimin Han of University of Iowa, and Xiaoliang Cheng of Zhejiang University.