



YHUBEPCUTET MFY-NNN B WHEATER SHENZHEN MSU-BIT UNIVERSITY

应用数学讲座

Научный Семинар по Прикладной Математике Research Seminar on Applied Mathematics

应用数学报告(92)

报告人 / Докладчик / Speaker: Postdoc Catharine W.K. Lo, City University of Hong Kong

题目 / Название / Title: Determining Sources in the Bioluminescence Tomography Problem

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摘要 / Аннотация / Abstract:

In this talk, we revisit the bioluminescence tomography (BLT) problem, where one seeks to reconstruct bioluminescence signals (an internal light source) from external measurements of the Cauchy data. As one kind of optical imaging, the BLT has many merits such as high signal-to-noise ratio, non-destructivity and cost-effectiveness etc., and has potential applications such as cancer diagnosis, drug discovery and development as well as gene therapies and so on. In the literature, BLT is extensively studied based on diffusion approximation (DA) equation, where the distribution of peak sources is to be reconstructed and no solution uniqueness is guaranteed without adequate a priori information. Motivated by the solution uniqueness issue, several theoretical results are explored. The major contributions in this work that are new to the literature are two-fold: first, we show the theoretical uniqueness of the BLT problem where the light sources are in the shape of C^2 domains or polyhedral- or corona-shaped; second, we support our results with plenty of problem-orientated numerical experiments.

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