



深圳北理莫斯科大学

УНИВЕРСИТЕТ МГУ-ППИ В ШЭНЬЧЖЭНЕ

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 (30)

报告人 / Докладчик / Speaker: 王薇 教授 (嘉兴学院)

题目 / Название / Title: An asymptotical regularization with convex constraints for inverse problems

时间 / Время / Time: 03 Mar. 2022, 8:30-10:30

地点 / Место / Venue: 主楼 336

摘要 / Аннотация / Abstract:

We investigate the method of asymptotical regularization for the stable approximate solution of nonlinear ill-posed problems  $F(x)=y$  in Hilbert spaces. The method consists of two components, an outer Newton iteration and an inner scheme providing increments by solving a local coupling linearized evolution equations. In addition, a non-smooth uniformly convex functional has been embedded in the evolution equations which is allowed to be non-smooth, including  $L^1$ -liked and total variation-like penalty terms. We establish convergence properties of the method, derive stability estimates, and perform the convergence rate under the Hölder continuity of the inverse mapping. Furthermore, based on Runge-Kutta (RK) discretization, different kinds of iteration schemes can be developed for numerical realization. In our numerical experiments, four types iterative scheme, including Landweber type, 1-stage explicit, implicit Euler and 2-stage RK are presented to illustrate the performance of the proposed method.

王薇教授简介:

王薇, 理学博士, 教授, 硕士生导师。2011年4月在哈尔滨工业大学获得理学博士学位。2011年7月至2013年7月在复旦大学从事博士后研究工作。研究方向为反问题理论与计算, 也包括地震波全波形反演、EIT问题、CT不完全数据的图像重构等应用。主持国家自然科学基金项目2项(青年基金项目、面上项目), 浙江省自然科学基金项目2项(青年基金、一般项目), 在 Numer Math、Inverse Problems 等有影响力的国际学术期刊上发表 SCI 论文 20 余篇。

访问学者以及需要做报告的学者请联系 张晔 教授 / Всем желающим выступить с докладами на семинаре просьба обращаться к Чжану Е [ye.zhang@smbu.edu.cn](mailto:ye.zhang@smbu.edu.cn)