岩土力学与工程前沿讲坛

Forum on Geomechanics and Geo-engineering

No.SKL*2024-02*

应岩土力学与工程国家重点实验室邀请，德国地学研究中心（GFZ）冀胤霖博士来访交流并做学术报告，报告信息如下：

报告人 Lecturer	**冀胤霖**
报告题目 Theme	**Controlling post-injection earthquakes in Enhanced Geothermal Systems**
报告时间 Time	**2024 年 1 月 29 日（周一）上午 10:00**
报告地点 Spot	**武汉岩土所研发大楼 8 楼学术交流室**

欢迎广大科研人员及研究生参加！

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报告摘要

Induced earthquakes after the termination of subsurface fluid injection have been a major obstacle to the success of Enhanced Geothermal Systems (EGS) and other contemporary subsurface injection activities. Recent studies reveal that changes in pore pressure and poroelastic stress as well as Coulomb static stress transfer could solely or collectively trigger post-injection earthquakes. Nevertheless, recommendations for shut-in strategies to mitigate post-injection seismicity are currently fragmented. To explore the optimal shut-in strategy in EGS, we performed laboratory-scale fluid depressurization experiments and field-scale modeling of the Pohang EGS. Results show that immediate fluid extraction from the injection well during shut-in is effective in preventing fault from dynamic slip in the laboratory-scale and reducing the probability of occurrence of large-magnitude earthquakes in the field-scale Pohang EGS, primarily by reducing pore pressure buildup and Coulomb static stress transfer. This leads to the conclusion that fluid extraction is recommended in most EGS in low-permeability crystalline reservoirs.

报告人介绍

冀胤霖，德国亥姆霍兹联合会(Helmholtz Association)青年科学家创新团队 ARES 核心成员，德国地学研究中心（GFZ）博士后，2020 年博士毕业于新加坡南洋理工大学（NTU）。近年来，以非常规地质能源安全高效开采 (如深地热) 和存储 (如二氧化碳和氢气) 为背景，开展了大量岩石物理力学相关研究工作。迄今为止，以第一作者在地学领域顶级期刊 GRL（Nature Index, 3 篇）和 Earth-Science Reviews（IF: 12.1），以及岩石力学和工程地质顶级期刊 IJRMMS、RMRE 和 Engineering Geology 等学术期刊上发表学术论文 16 篇。担任 2022 年波兰国家基金重大项目海外评审专家，2022 年法国海洋开发研究院专项博士课题外部评审专家，和包括 Nature Communications, JGR, IJRMMS, RMRE, Geothermics, Engineering 和 GJI 等在内的几十种国内外学术期刊经常性审稿人。目前任 Deep Underground Science and Engineering 和 Journal of Rock Mechanics and Geotechnical Engineering 科学编辑。获 Deep Underground Science and Engineering 最佳青年编委奖（2023），两度获 Journal of Rock Mechanics and Geotechnical Engineering 杰出审稿人奖（2022&2023），并获 NTU 土木与环境工程学院最佳博士论文奖（2021）和最佳助教奖（2019），新加坡岩石力学与工程地质协会（SRMEG）最佳报告奖（2020）等。