

考虑应力梯度的原生裂隙水压致裂法地应力测量的原理及工程应用

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摘要 介绍原生裂隙水压致裂法地应力测量的原理及其与经典水压致裂法的异同之处, 并探讨在单钻孔中考虑沿铅直钻孔轴向应力梯度的应力场的反演方法。在求解某液化石油气地下储备库工程应力场的过程中, 假定区域应力场在拟建洞室附近的小区内呈线性关系, 并将参考点选在洞室附近某点, 与前人将参考点选在地面并假定区域应力场从地面至钻孔底部整个深度区间内呈线性关系的研究成果相比, 无疑使得计算结果更趋合理。同时将遗传算法应用于求解应力场任意一点的完全应力张量, 得到比较满意的结果。

关键词 [岩石力学](#); [原生裂隙水压致裂法](#); [应力场](#); [应力梯度](#); [遗传算法](#)

分类号

DETERMINATION OF IN-SITU STRESS BY HYDRAULIC FRACTURING TESTS ON PREEXISTING FRACTURES CONSIDERING STRESS GRADIENT AND ITS ENGINEERING APPLICATION

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Abstract

Abstract: The theory of in-situ stress determination based on hydraulic fracturing tests on preexisting fractures(HTPF) is presented. The similarities and differences between the HTPF and the classical hydraulic fracturing(HF) technique are discussed. The inversion method for 3D in-situ stress field considering stress gradient along the vertical borehole axis is also introduced. In the course of searching for the principal stresses of stress field in a liquefied petroleum gas underground storage project, the regional stress field is supposed to be continuous only in a small section near the cavity area and the referential point is also chosen to be located in this area. Compared with previous studies that the regional stress field is assumed to be continuous in the whole depth of the borehole and the referential point is chosen to be at ground surface, the result by the proposed method is more reasonable. The complete stress tensor of regional stress field is obtained based on the genetic algorithm; and the result is satisfactory.

Key words [rock mechanics](#); [hydraulic fracturing tests on preexisting fractures](#); [stress field](#); [stress gradient](#); [genetic algorithm](#)

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