Supporting Information for

The role of in-situ stress in organizing flow pathways in natural fracture networks at the percolation threshold

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Introduction

This document provides flow simulation results in the y-direction for various stress cases. To calculate the flow field, a vertical hydraulic gradient is applied to the fracture networks, where the fracture apertures are derived from geomechanical simulations with zero, isotropic and anisotropic far-field stress loadings. The material properties of the fracture networks and fluids used in these simulations are the same as listed in Table 1 of the manuscript.

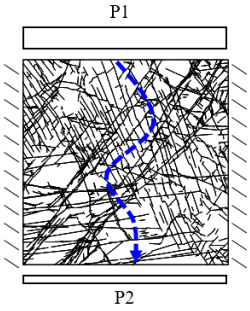

Figure S1. Hydraulic boundary conditions for fluid flow simulations presented in this supporting information file.

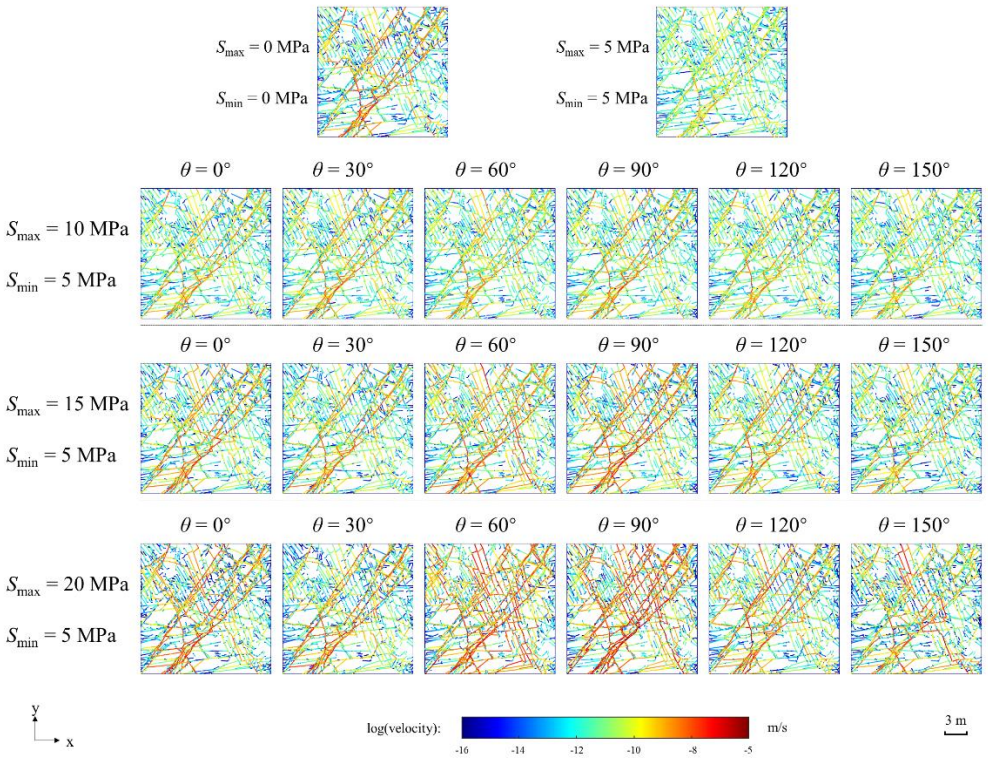

Figure S2. Distributions of flow velocity in the fracture network under different stress conditions.

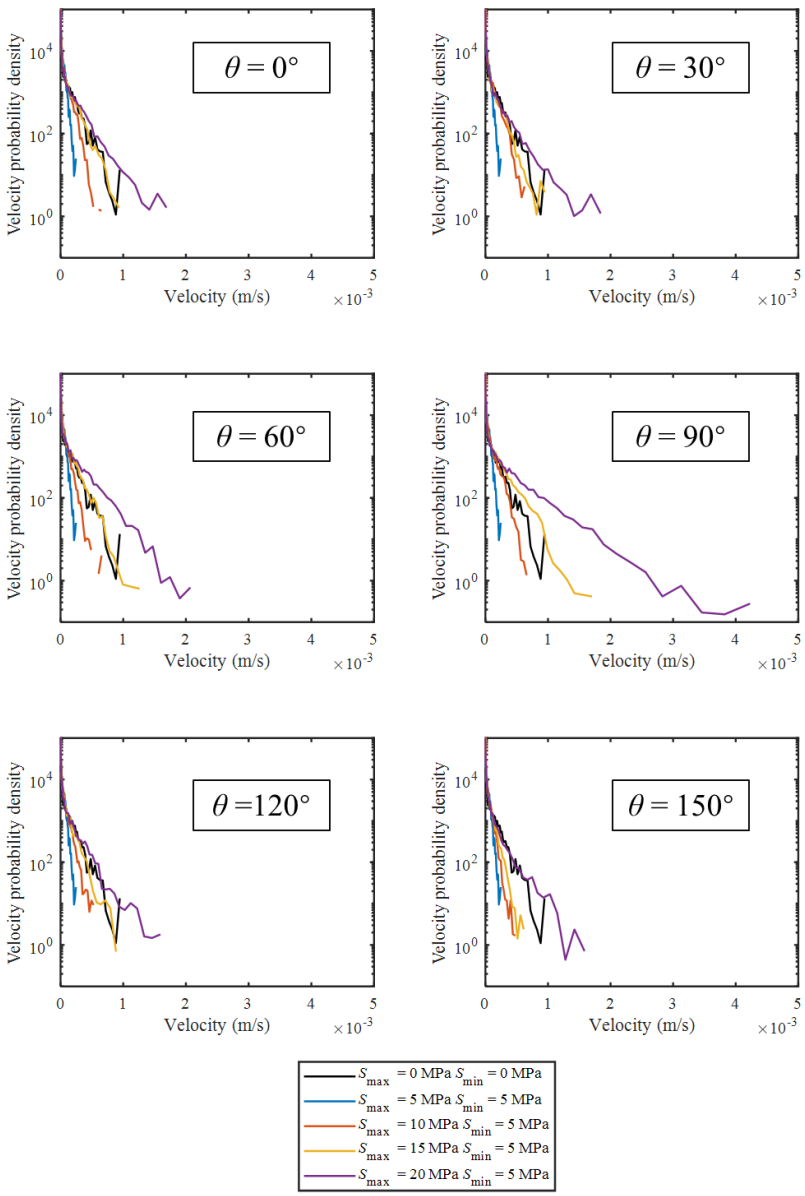

Figure S3. Probability density function of the flow velocity in the fracture network under various stress conditions.

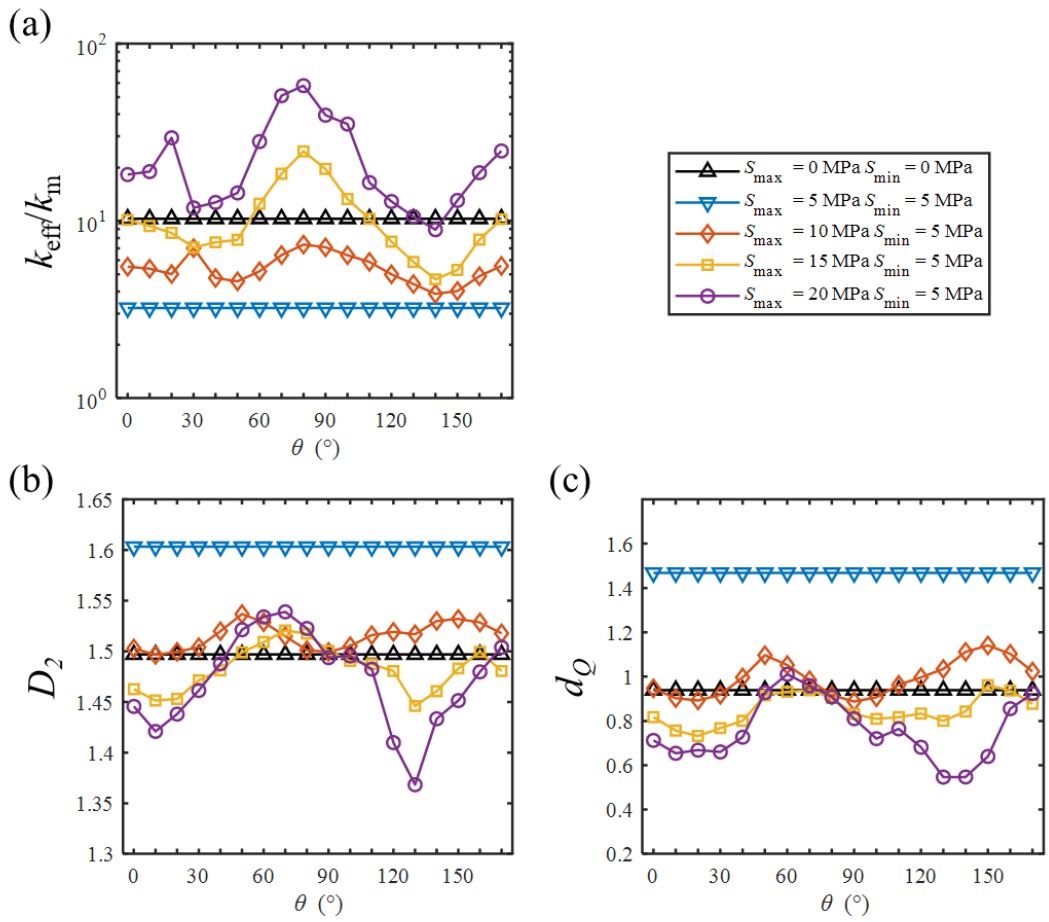

Figure S4. Quantitative indices for evaluating flow magnitude and distribution in fracture networks under different stress conditions: (a) effective permeability, (b) correlation dimension of flow rate, and (c) flow channeling density indicator.

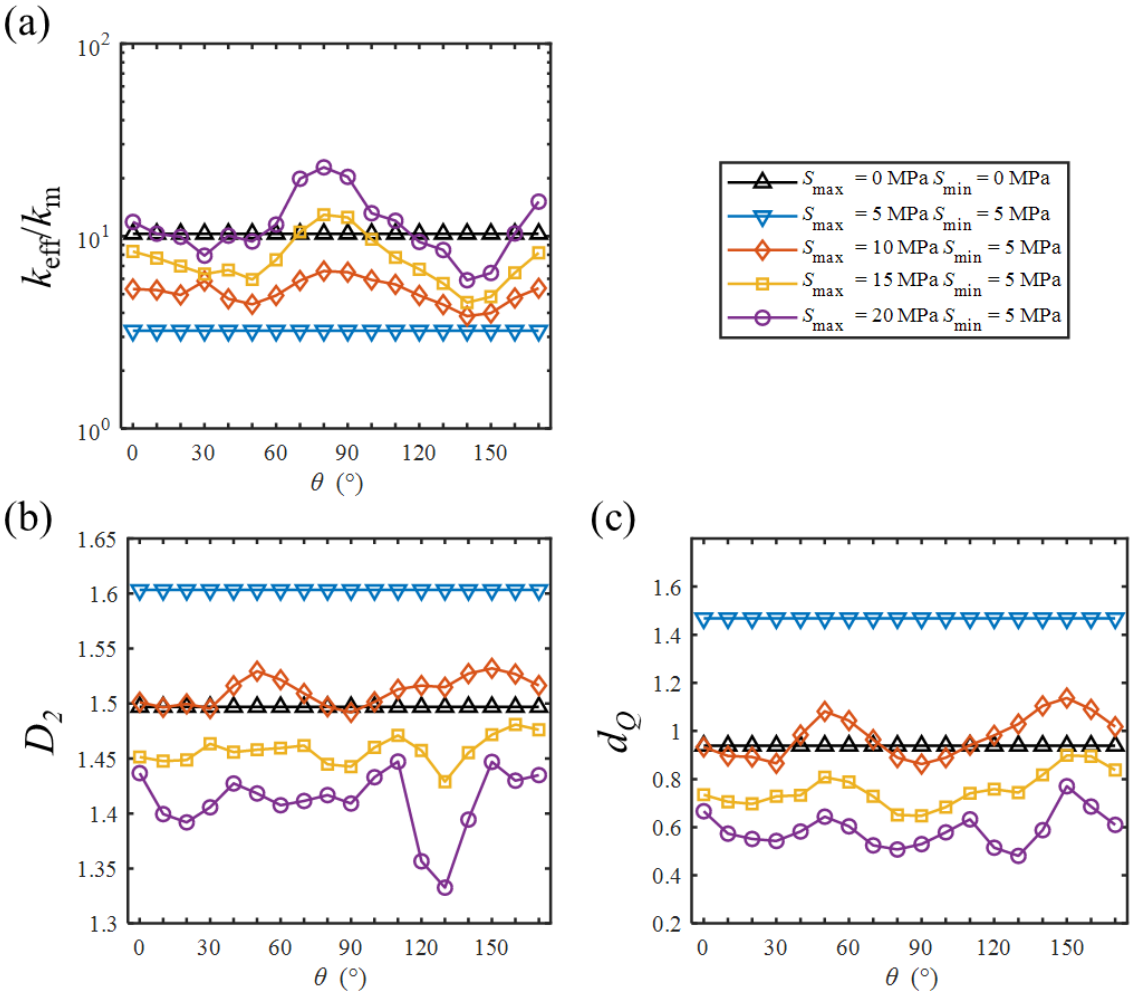

Figure S5. Quantitative indices for evaluating flow magnitude and distribution in fracture networks under different stress condition after removing the new cracks. (a) effective permeability. (b) correlation dimension of flow rate. (c) flow channeling density indicator.