

SOLUTION MINING RESEARCH INSTITUTE

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MEETING
PAPER



LABORATORY HYDRAULIC FRACTURING EXPERIMENTS

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INTRODUCTION

A program of laboratory hydraulic fracturing experiments has been carried out on Avery Island salt to determine the validity of hydraulic fracturing stress measurements in non-elastic media. Three sets of experiments have been performed. The first set of experiments was performed on 150mm diameter salt cores to assess how the breakdown pressure is influenced by the following:

- o time between application of load and fracturing,
- o flow rate,
- o borehole diameter, and
- o hydrostatic confining pressure.

The second set of experiments was performed on rectangular prisms 30cm by 30cm in cross section and 46cm long. These blocks were loaded polyaxially under a range of confining pressures to determine how breakdown pressure is influenced by non-hydrostatic stresses. The third set of experiments was undertaken to determine how the form of the hydraulic fracture changes as a function of the ratio of the far-field stresses normal to the borehole axis. The goal of this last set of tests was to see how small a stress ratio is required for the hydraulic fracture to be preferentially oriented.

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