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## The efficacy of heat sensitive epoxy foam for permeability alteration in fractured geothermal fields –Laboratory experiments

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Geothermal energy plays an important role in the transition towards renewable and carbon-neutral energy resources. For some geothermal fields enhancing water-rock heat exchange is required by either fracking or by blocking large conduits. Here we test a novel approach for blocking large fractures using heat sensitive epoxy resin foam droplets that can be advected to target regions of the geothermal and then thermally activated to foam (release CO<sub>2</sub>) and simultaneously cure to create obstacles and reduce local permeability. Laboratory experiments using aluminum-glass fracture models provide insights into the process by visualizing resin droplet transport and subsequent temperature-induced foaming and curing that visually show pathway blocking and reduced permeability. A conceptual model for flow and transport of droplet swarms in single fracture is developed to illustrate how aperture modifications affect upstream pressure, flow pathways and permeability.

### Country

United state

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### References

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