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# Modelling crack propagation and fluid injection applied to geothermics

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In order to developing an efficient computational code to simulate hydraulic stimulation in a reservoir, we are extending the modelling and solving capabilities of the software LaMEM. This software (Lithospheric and Mantle Evolution Model) is a massively parallel 3D staggered grid finite difference code developed at University of Mainz which is capable to model lithospheric deformation in visco-elasto-plastic rocks. We added poroelasticity, plasticity and Darcy flow to model crack propagation and fluid injection in reservoir rocks with the aim to apply it to geothermics. As a first step, and to take into account for the fluid pressure in the rocks, we solved the Darcy equation and we coupled it in the code. As the second step, we are investigating failure patterns created by shear/tensile failure in poro-elasto-plastic media due by localized pore pressure increasing.