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# Fluid-total pressure partitioning in shear banding poro-visco-elasto-plastic media

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Fluid injection is one of the main triggers of induced seismicity. Accurate numerical modeling of such processes is crucial for the safety of many affected regions. We propose a high-resolution numerical simulation of the strain localization in elasto-plastic and poro-visco-elasto-plastic media with a particular focus on the fluid pressure distribution. The resolution of our numerical model is 10000 by 10000 grid cells. The simulation is accelerated using graphical processing units (GPUs), thus, the total simulation time is in the order of a few minutes. We implement a pressure-dependent Mohr-Coulomb plastic law and study the influence of fluid pressure on the triggering of shear bands. Mean stress is partitioned between fluid pressure and total pressure. This study is particularly important since the effective stress law (the difference between fluid and total pressures) controls brittle failure. We vary viscosity and permeability as well as initial conditions for fluid pressure to explore the physics of shear bands nucleation. We show that fluid pressure in hydro-mechanically coupled media significantly affects the strain localization pattern compared to only elasto-plastic media. Permeability and viscosity are important parameters that control the fluid pressure distribution in the localized shear zones. This work is a preliminary study to model induced seismicity due to the fluid injection in fluid-saturated rocks described as fully coupled poro-visco-elasto-plastic media.