Minimum Work Applied to Frictional Faults: Analytical and Numerical Approach

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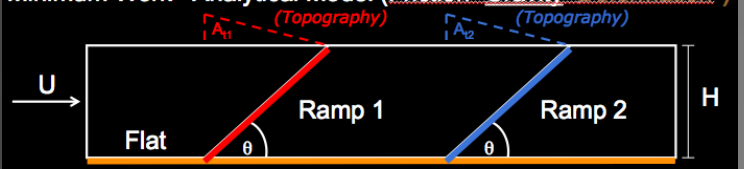
We aim to investigate the effect of systematically varying the coefficient of sliding friction on preexisting thrust/ramp faults to evaluate their activity based on minimum work theory

Theoretical Method

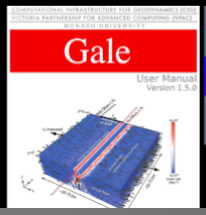
Dimensions

Minimum Work - Analytical Model (Friction+Gravity+Deformation*)



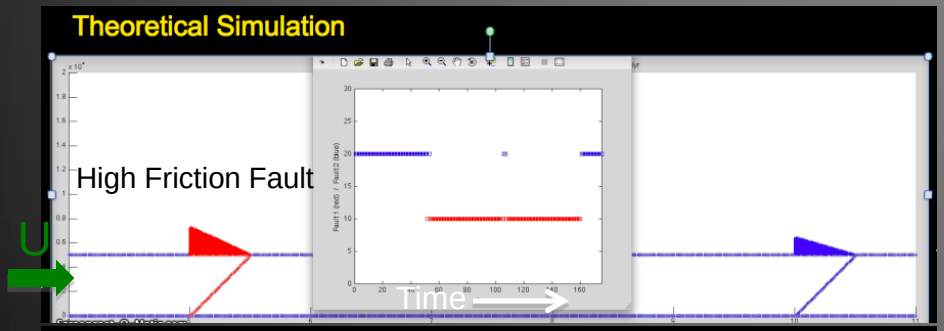
Numerical Method

Numerical material properties & boundary conditions



We insert heterogeneities varying the coefficient of friction

Theoretical Simulation



Numerical Simulation

Our data suggest that frictional heterogeneities, in both theoretical and numerical simulations, can control fault reactivation (Out-of Sequence) . Our next goal will be to couple realistic surface erosion rules to the uplifting fault blocks to evaluate their effect on fault activity .

Numerical Simulations of tectonic wedges with different erosion rates