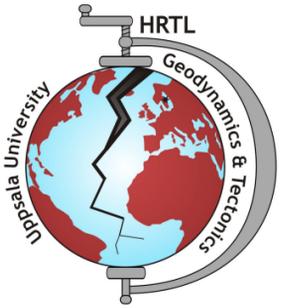


Anisotropy of magnetic susceptibility as strain indicator in a fold-and-thrust belt sandbox model above décollements with frictional contrast

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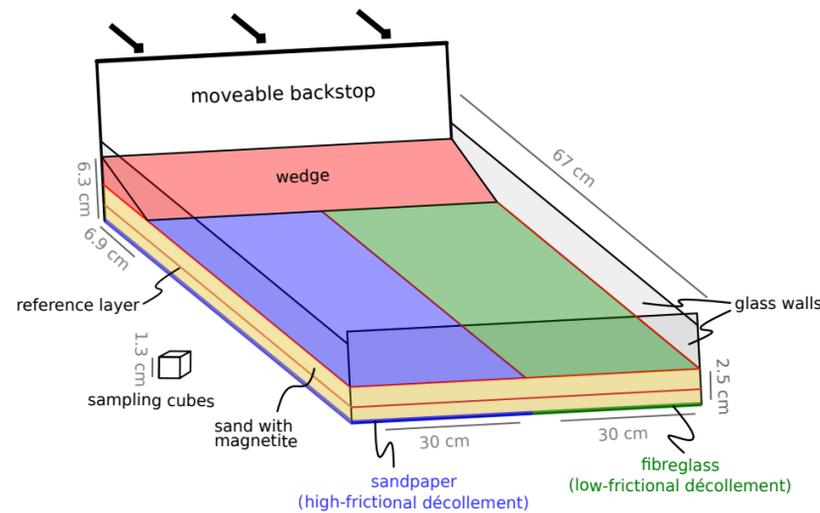
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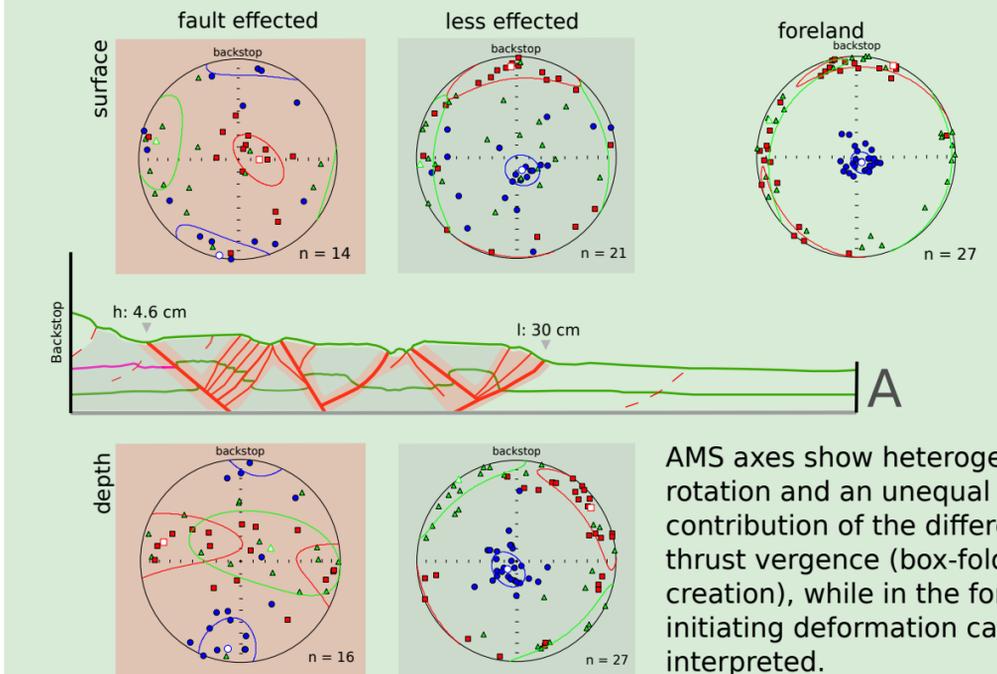
Background:

- shortening of a magnetite-sand mixture above two different adjacent frictional décollements^{1,2}
- taking sections and samples from wetted deformed model
- measuring anisotropy of magnetic susceptibility (AMS) in samples with MFK1-FA Kappabridge (Agico Inc.)
- AMS provides average orientation of grain axes in model plotted on stereographic projection

Experimental Setup:

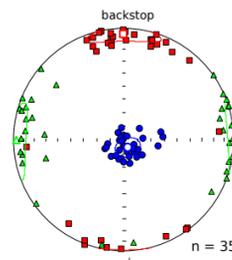


low-frictional décollement fabrics

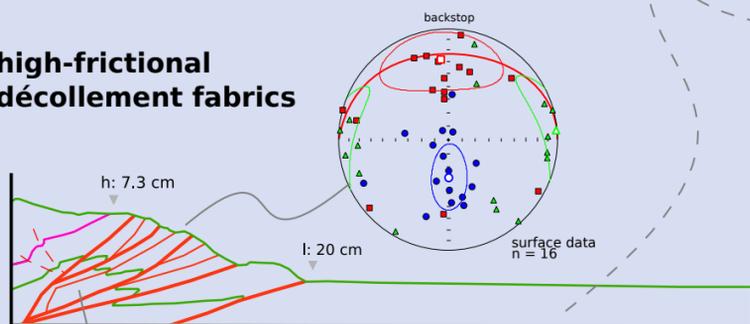


AMS axes show heterogeneous rotation and an unequal contribution of the different thrust vergence (box-fold creation), while in the foreland initiating deformation can be interpreted.

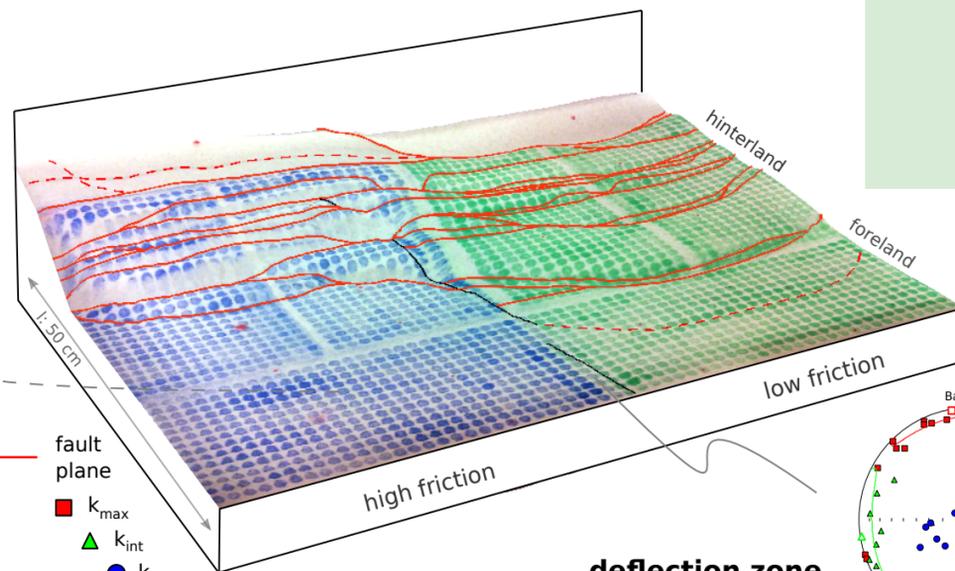
initial model fabric from undeformed foreland (influenced by scraping)



high-frictional décollement fabrics

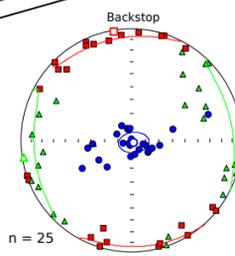


AMS axes cluster represent orientation of thrust faults, which are more defined at depth due to closely spaced imbricates and a general increase of strain with depth.



deflection zone fabric

k_{min} spreads along a plane perpendicular to strike-slip fault.



Implications:

Results can be compared to natural examples like Southern Pyrenees, Spain³, Zagros mountains, Iran⁴ or Potwar region, Pakistan⁵.

Outlook:

Further sandbox modelling is in progress to understand the magnetic fabric along and in the vicinity of modelled thrusts. Different materials will be tested to understand grain reorientation and its influence of AMS signal in analogue models.

Summary:

AMS reflects different propagation and style of deformation above different décollement friction.

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