

Fold kinematics resolved in the Sant Llorenç de Morunys growth fold, southeastern Pyrenees, Spain

Marisa N. Repasch¹

David J. Anastasio², James H. Carrigan², and Josep M. Parés³

A Baccalaureate thesis completed at Lehigh University, May 2014

¹Department of Earth and Planetary Sciences, University of New Mexico

²Department of Earth and Environmental Sciences, Lehigh University

³CENIEH, Burgos, Spain



S

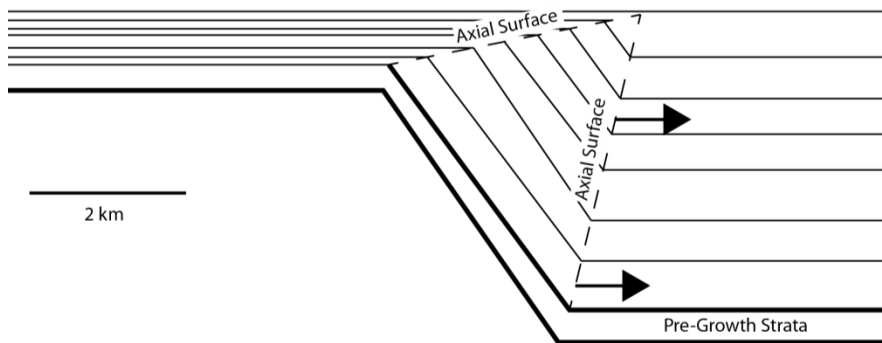
N



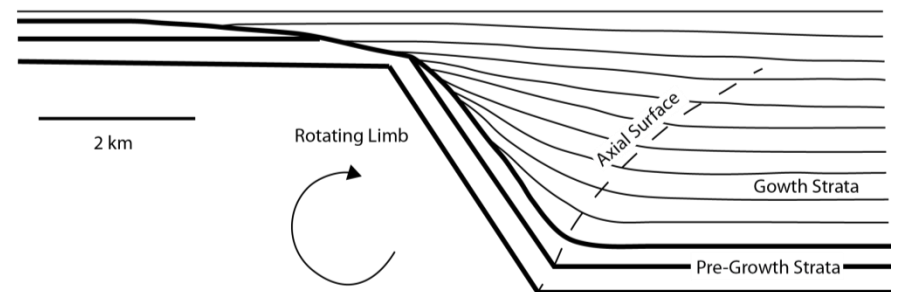
Kinematic Models



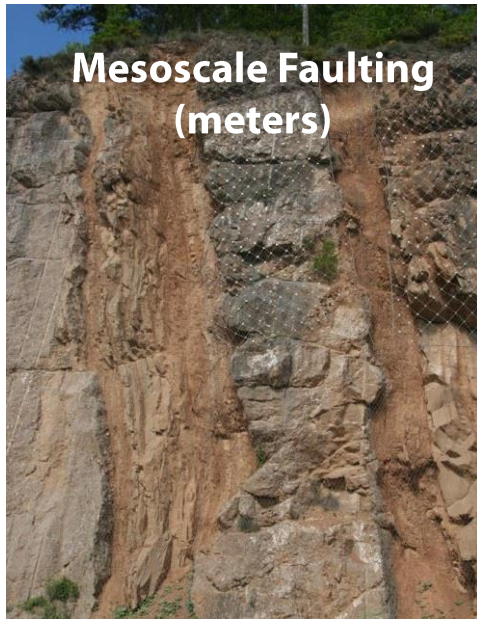
Migrating Hinge (i.e. Suppe *et al.*, 1997)



Fixed Hinge (i.e. Ford *et al.*, 1997)



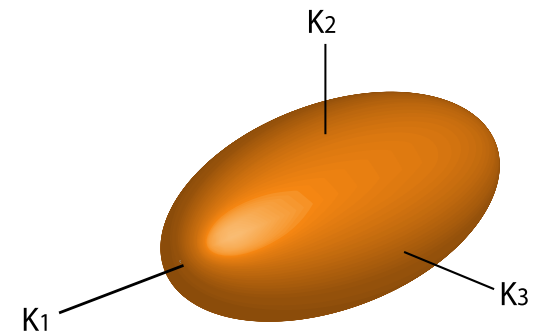
Strain



Anisotropy of Magnetic Susceptibility (AMS)



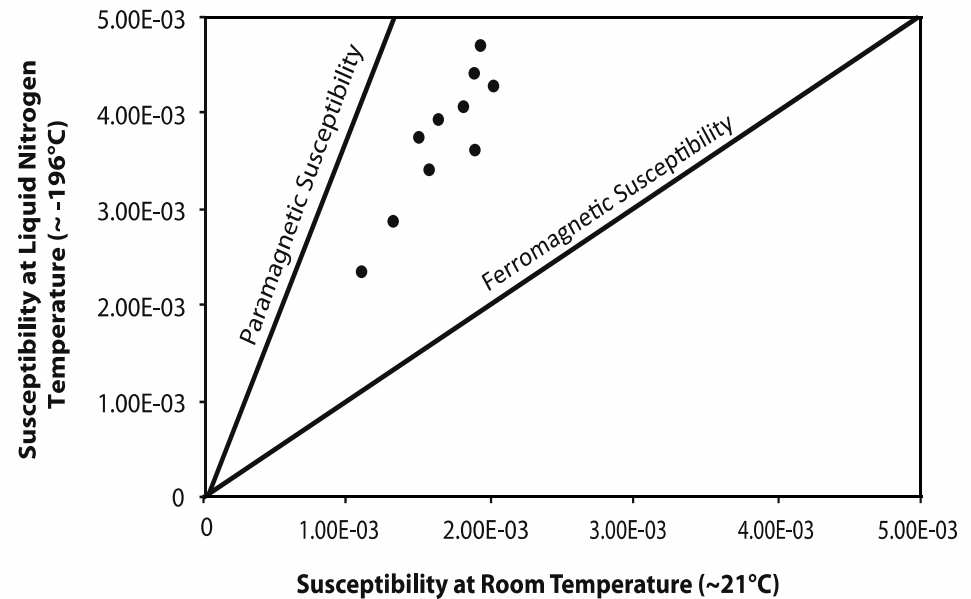
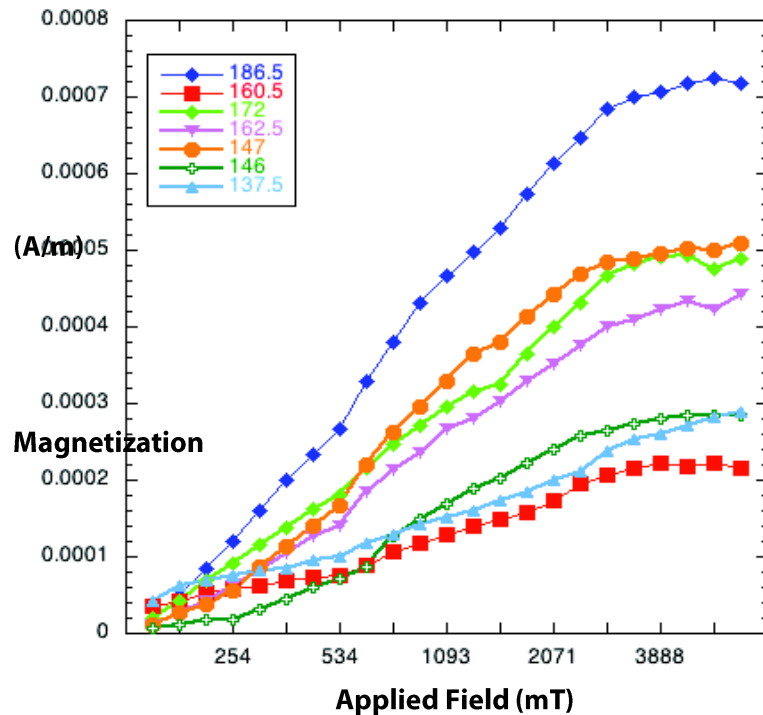
2.54 cm



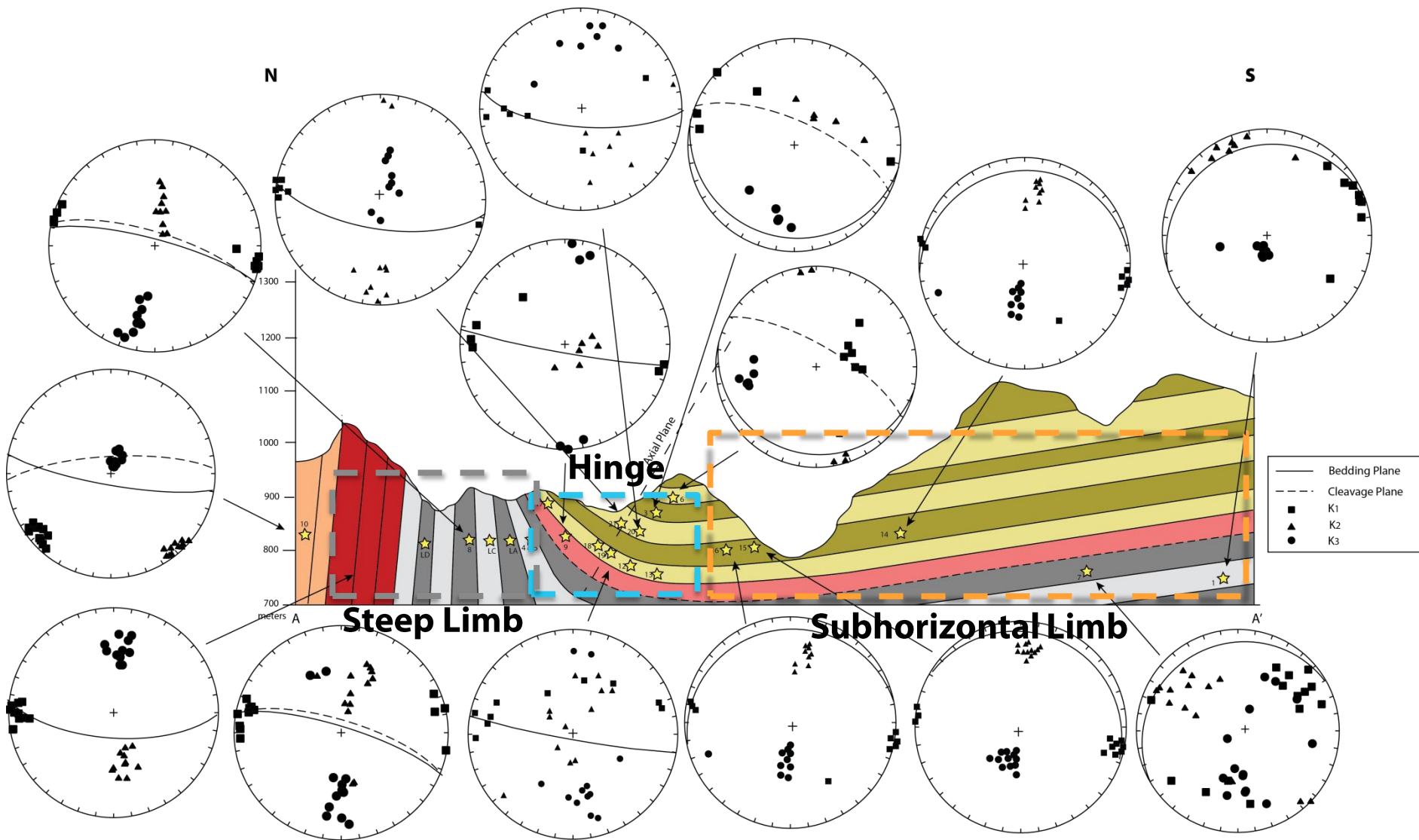
Principal Axes: $K_1 > K_2 > K_3$

Rock Magnetism

- Isothermal Remanent Magnetization (IRM)
- Low-Temperature Susceptibility
 - Paramagnetic and Ferromagnetic minerals



AMS Results – Orientation Data

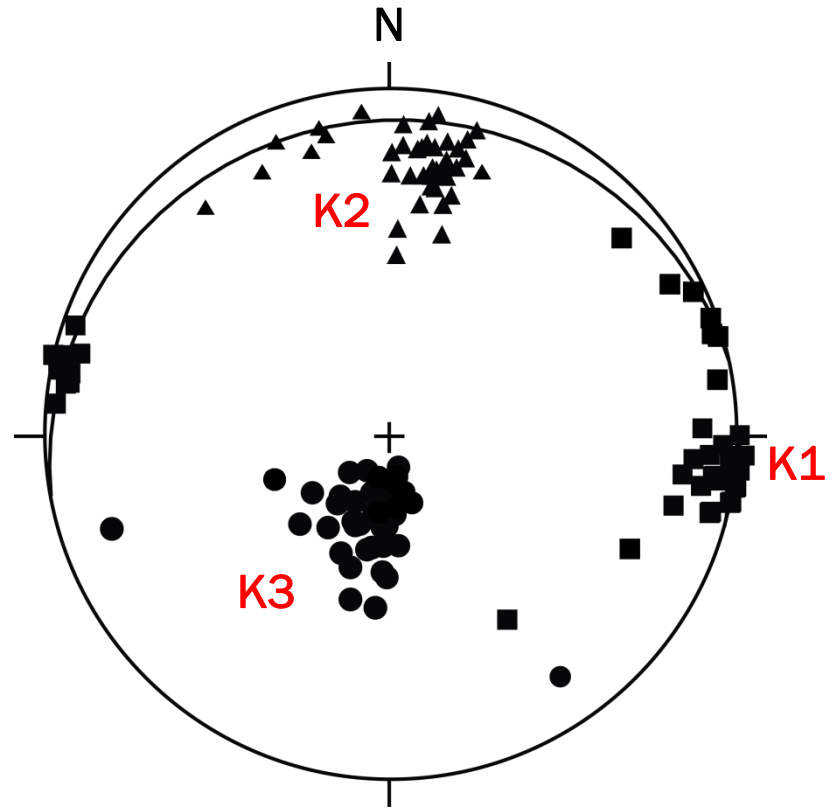


Subhorizontal Limb



6 sites, 43 specimens

- K3 parallel to pole to bedding
- K1 and K2 well clustered
- Intersection Lineation defines K1 perpendicular to shortening



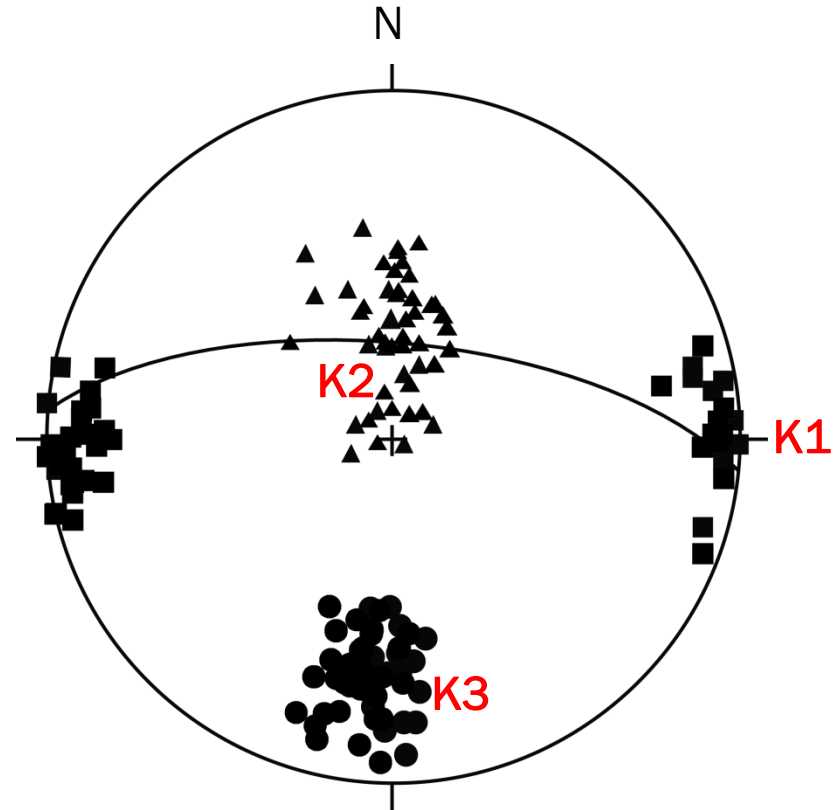
**Compaction Fabric with N-S Layer
Parallel Shortening**

Steep Limb



8 sites, 63 specimens

- K3 parallel to pole to bedding
- K1 and K2 well clustered
- Intersection Lineation defines K1 perpendicular to shortening



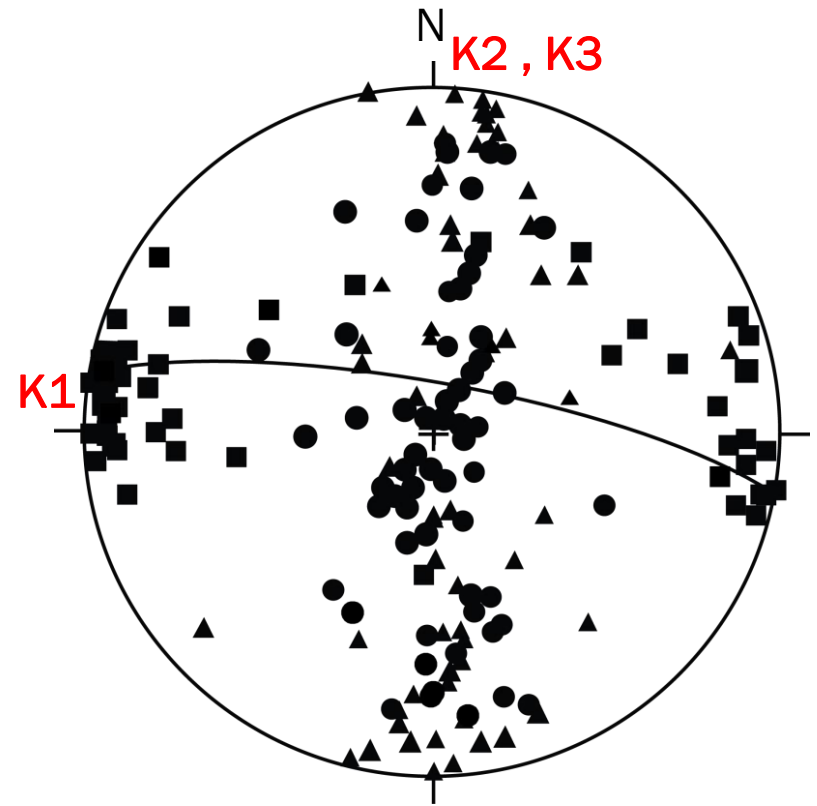
**Compaction Fabric with N-S Layer
Parallel Shortening**

Hinge Zone



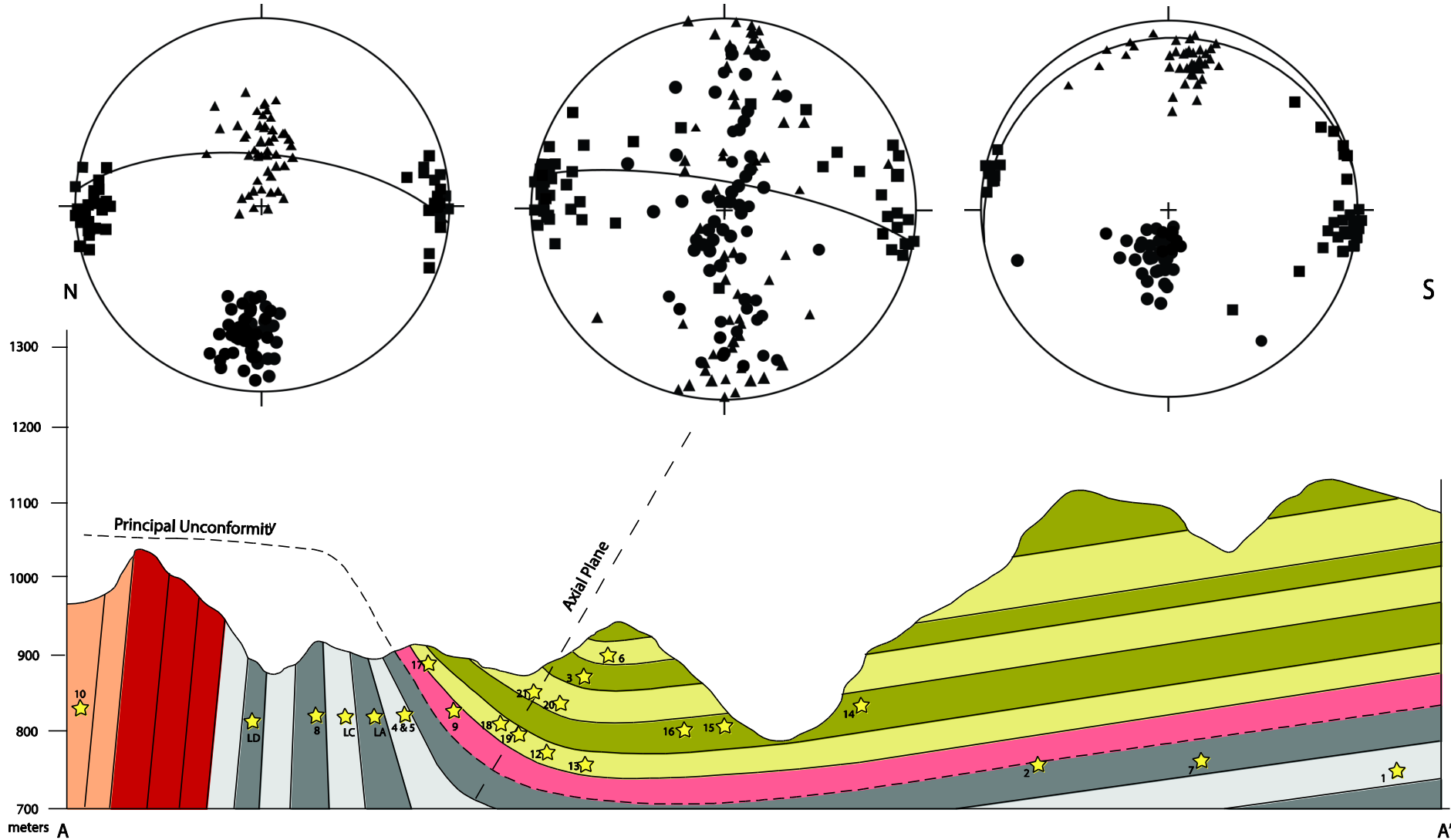
8 Sites, 61 specimens

- K1 intersection lineation
- K2 and K3 in a N-S trending girdle

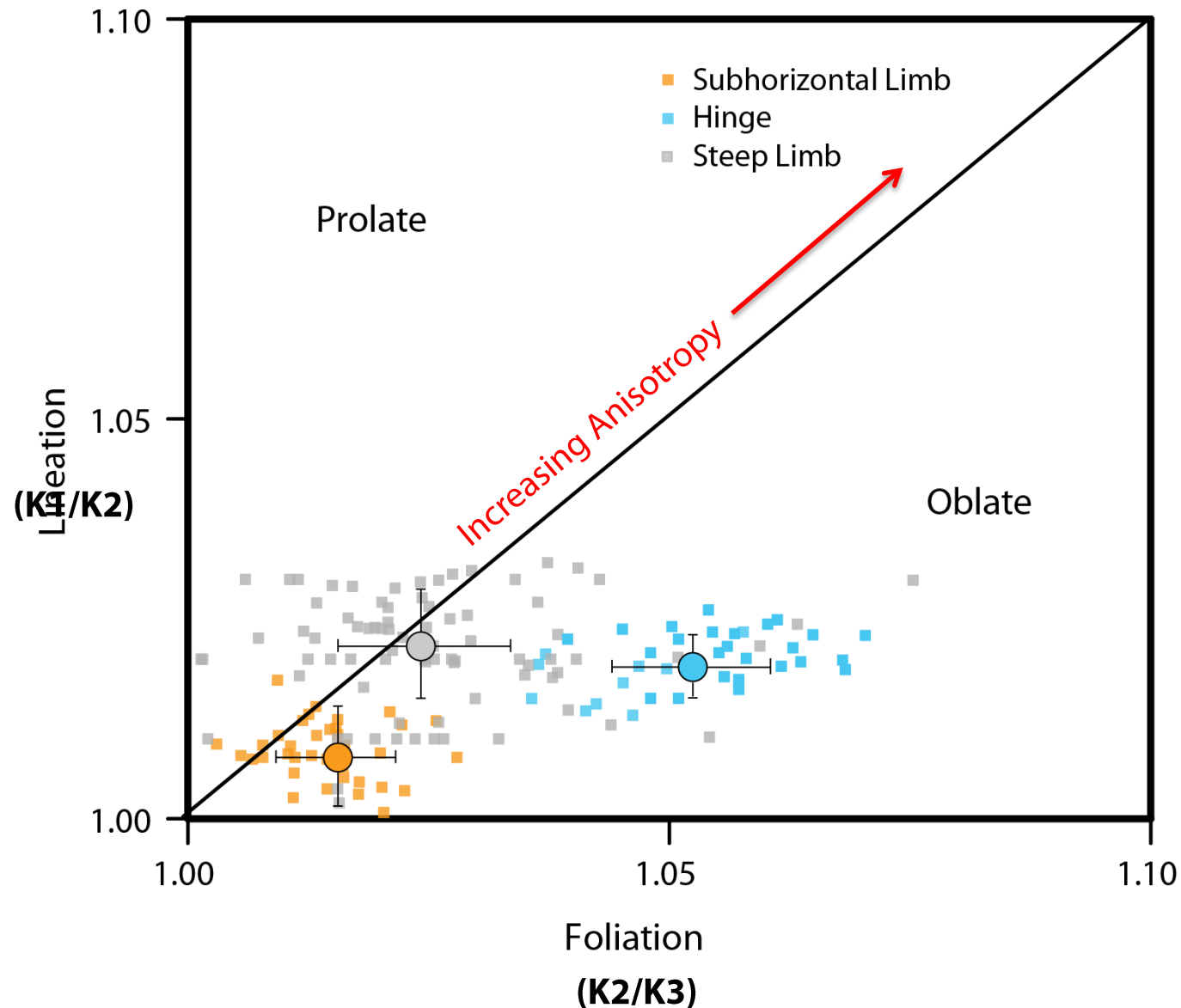


Tectonic Fabric

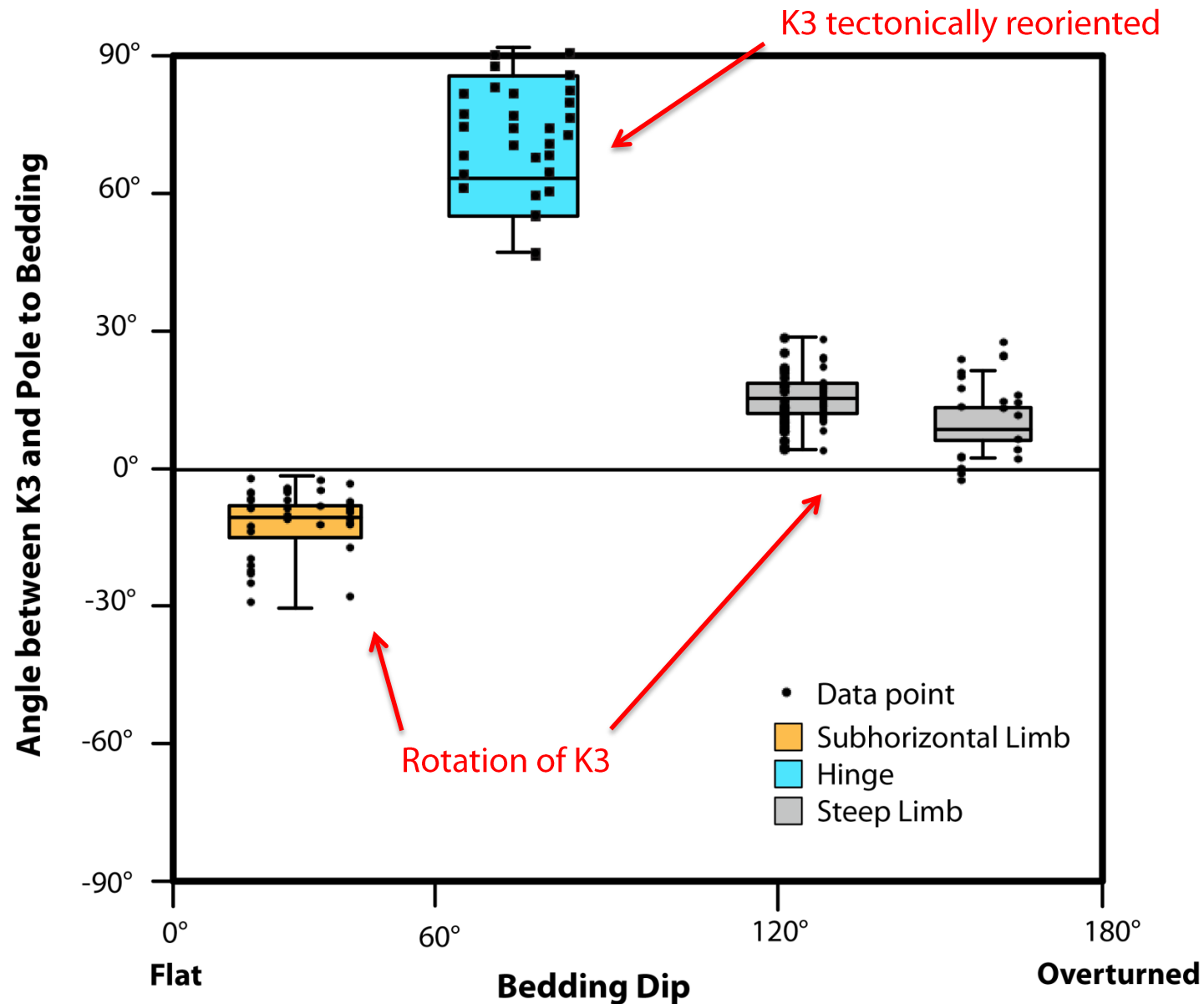
AMS Orientation Summary



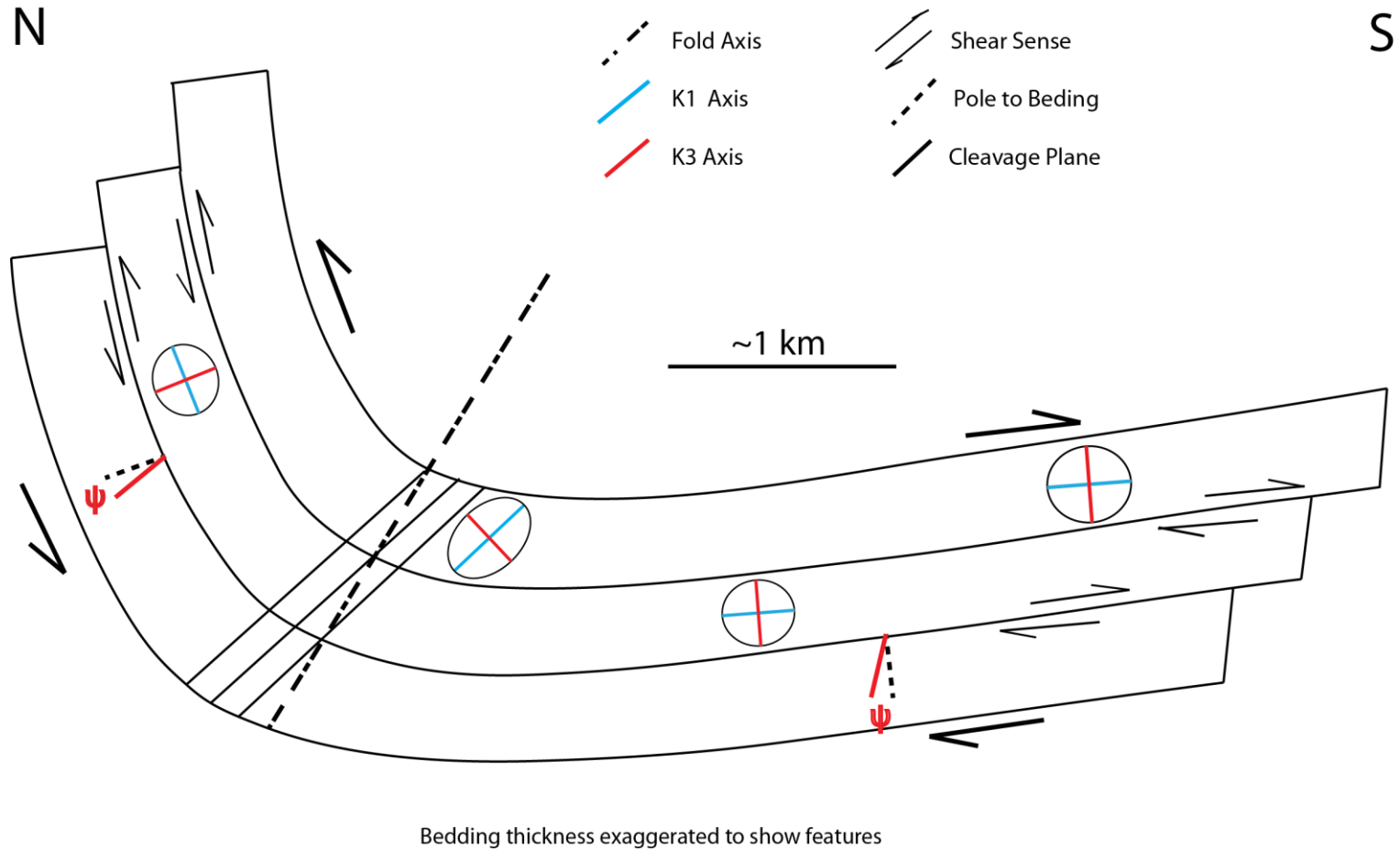
AMS Shape Anisotropy



Hinge vs. Limbs

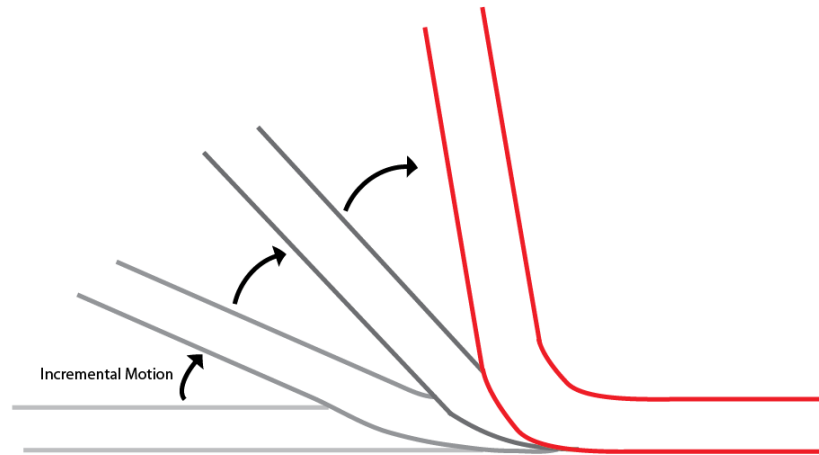


Review of AMS Fabrics

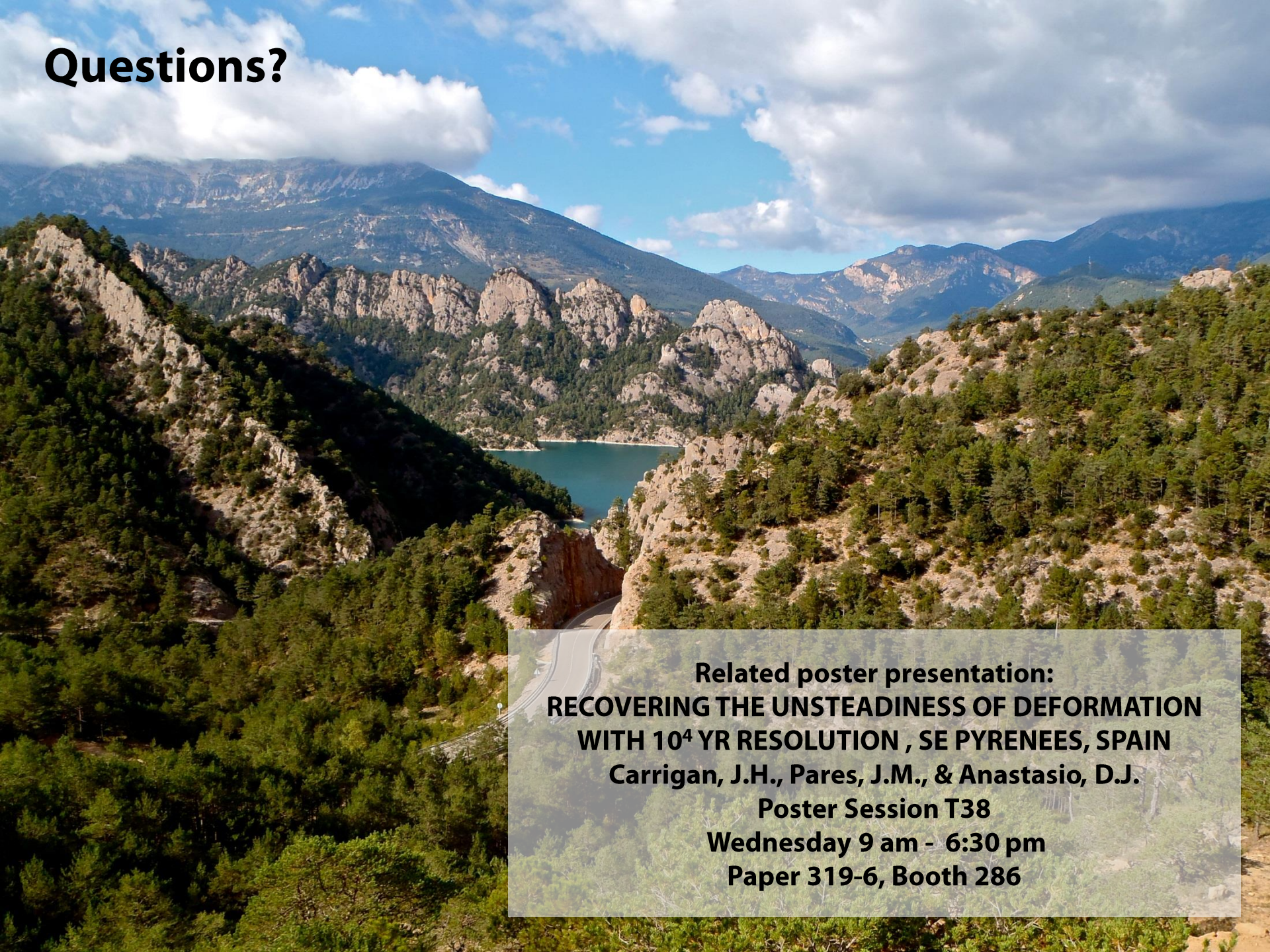


- **High strain, pervasive cleavage recorded in the hinge**
- **Sedimentary compaction and layer parallel shortening fabrics recorded in the limbs**
- **Flexural flow folding recorded by shear of K3 in the limbs**

Fixed Hinge Kinematics



Questions?



Related poster presentation:
RECOVERING THE UNSTEADINESS OF DEFORMATION
WITH 10⁴ YR RESOLUTION , SE PYRENEES, SPAIN
Carrigan, J.H., Pares, J.M., & Anastasio, D.J.
Poster Session T38
Wednesday 9 am - 6:30 pm
Paper 319-6, Booth 286