



Pre-conference workshop

Analogue and numerical modelling of crustal processes

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Morning Programme

- 09:35 - 10:05 Alexander Cruden
The search for new analogue modelling materials
- 10:05 - 10:35 Matthias Klinkmuller
Properties benchmark of granular and viscous analogue materials
- 10:35 - 11:00 Coffee break
- 11:00 - 11:30 Thomas Poulet
The role of multiscale elasticity to generate localized deformation and weakening for plate tectonics
- 11:30 - 12:00 Boris Kaus
Numerical implementation of brittle behaviour
- 12:00 - 12:30 Bertrand Maillot
Thrust wedge tectonics: analogue, numerical and analytical approaches
- 12:30 - 13:45 Lunch

Afternoon Programme

- 13:45 - 14:15 Summary of the GeoMod2004 experiments (SB)
Description of the GeoMod2008 setups (GS)
- 14:15 - 15:45 Poster session
(including coffee break)
- 15:45 - 16:10 Guido Schreurs:
Comparison of the analogue experiments
- 16:10 - 16:35 Susanne Buitter:
Comparison of the numerical experiments
- 16:35 - 16:55 Christoph Schrank:
PIV quantification of analogue results
- 16:55 - 17:55 Jean-Pierre Brun, Taras Gerya and Bertrand Maillot:
Discussion of analogue and numerical modelling
and the model comparisons
- 18:00 - GeoMod2008 icebreaker

General discussion

Questions asked by the discussion leaders and summary of the general discussion by Jean-Pierre Brun

1. Is Analog-Numerical benchmarking Useful? Useless? Directly useless but indirectly useful?
2. Is elasticity important? Yes! No! Yes in nature but not in sandbox.
3. Localization phenomena comparison:
What to look for?/ Shear band angles/Shear band distribution
Shear band migration / Shear band thickness (grain size dpt)?
4. Dilemma of glass wall. Do we put it?
- 5a. Making models is first of all a way to understand nature. Isn't?
- 5b. If 5a is OK the choice of initial and boundary conditions are of primary importance. How do we choose them?
6. Are there any robust analog/numerical setups for sandboxing?
Statistical models of variability.
7. 3D effects modelling: are we ready for it?
8. Analog boundary conditions: how to model them?
9. Comparison of analog vs. Numerical models by inversion?
If we can invert analog models we could also invert nature!
10. Should we stop with benchmarking or continue?

Summary of discussion 1 (JPB)

Is there a future for analogue modelling?

New questions are opening (e.g. surface processes)

Strange results are always interesting

Numerical & analogue must go together

Separating physics from experiments

Importance of initial and boundary conditions

Analogue modelling is an instrument to look at nature

Numerical models are increasing very fast in complexity and therefore more and more difficult to falsify

Summary of discussion 2 (JPB)

Benchmarking is essential to give to modelling its credibility

Lets keep the models as simple as possible

Lets try to interrogate fundamental earth processes

Instead trying to mimick reality lets try to understand the physics of processes to become able to predict nature.

Are model driven observations dangerous?

All models must be predictive and then able to be falsified.

Summary of discussion 3 (JPB)

Comparison analogue vs numerical models by inversion is an important target if robust analogue/numerical setup are available.

Numerical models should give the same type of variability as analogue models if random heterogeneities are introduced