

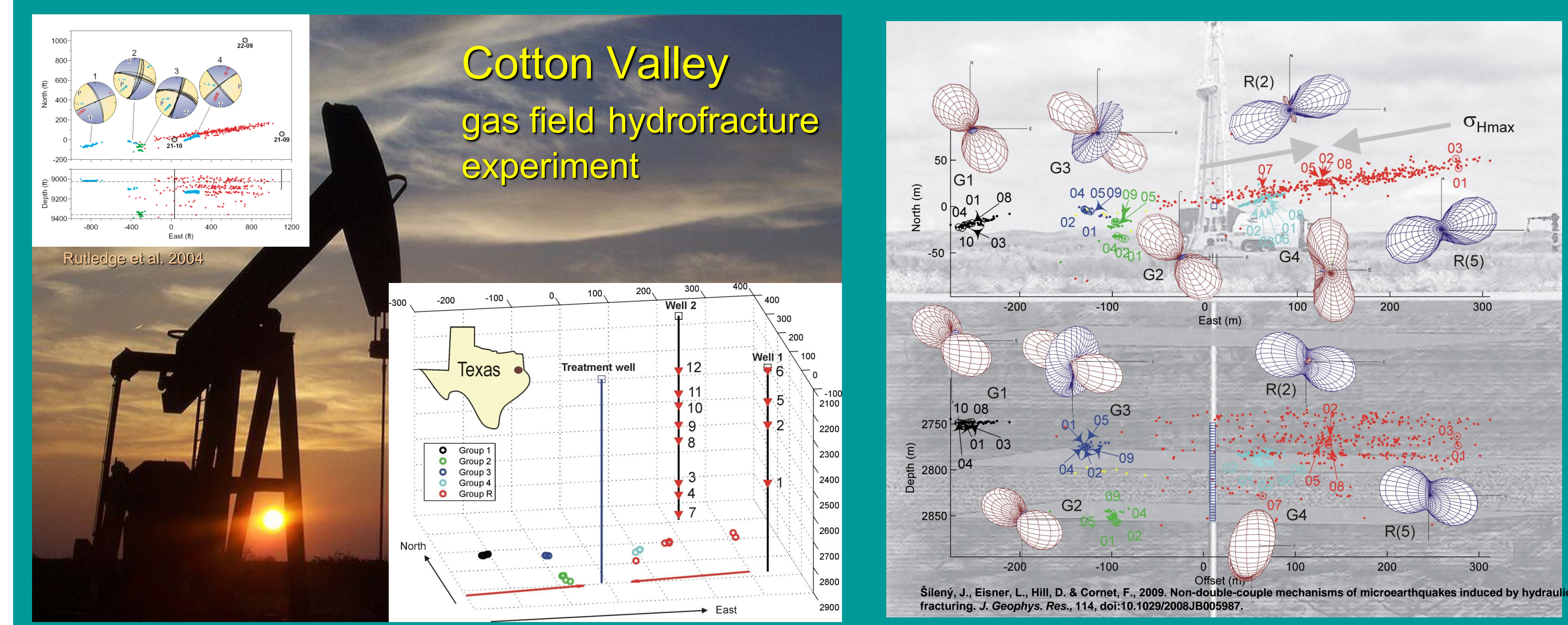
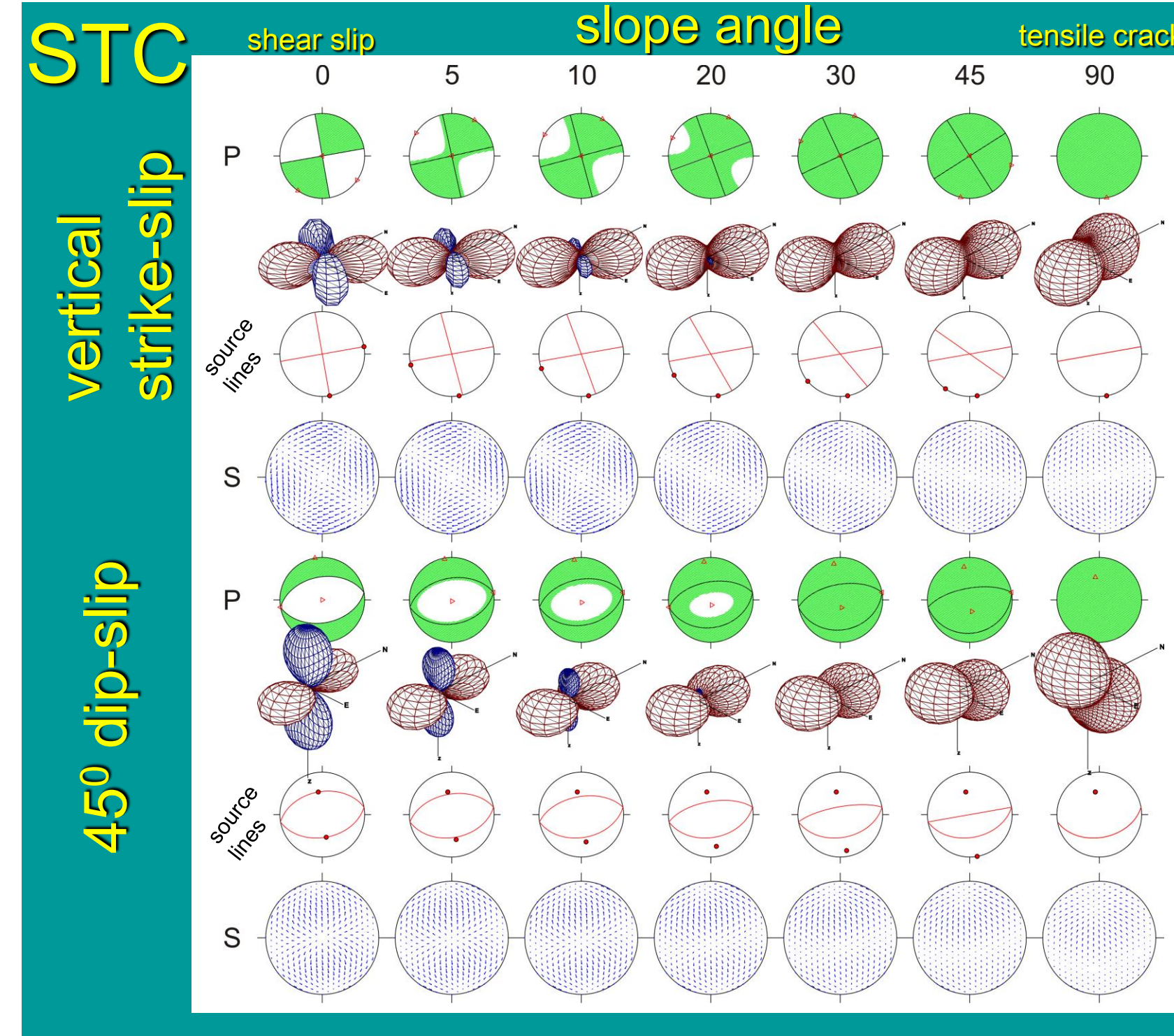
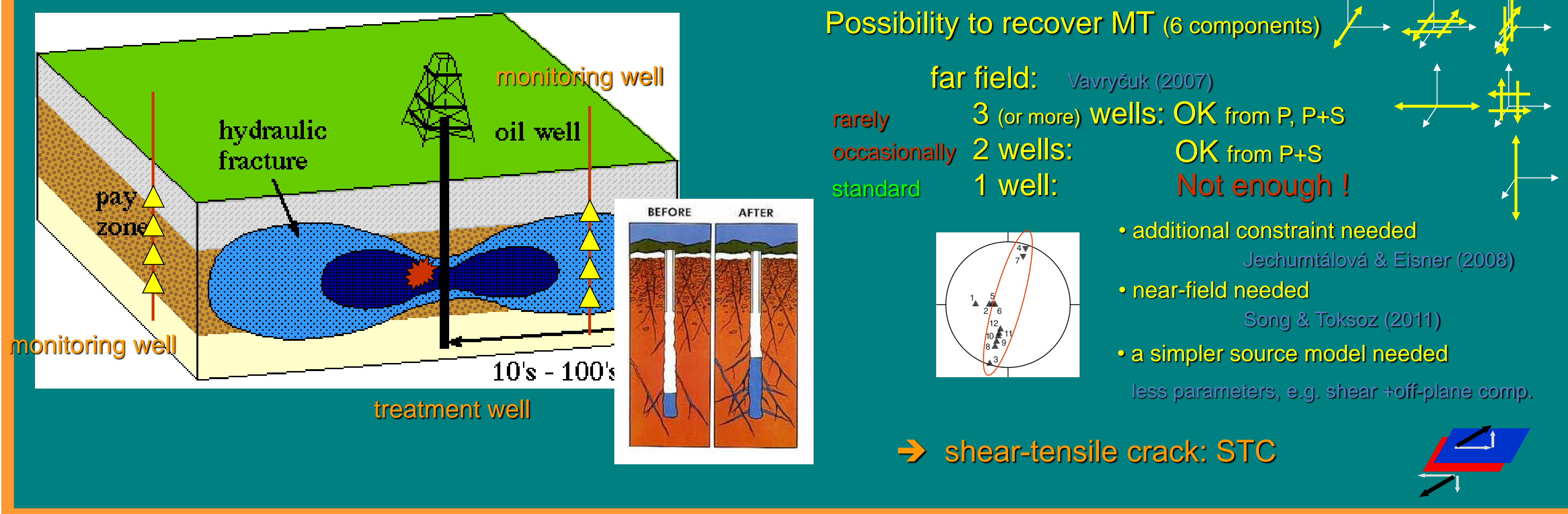
Shear-tensile source model vs. moment tensor: benefit in single-azimuth monitoring. Case study of Cotton Valley hydrofracture treatment

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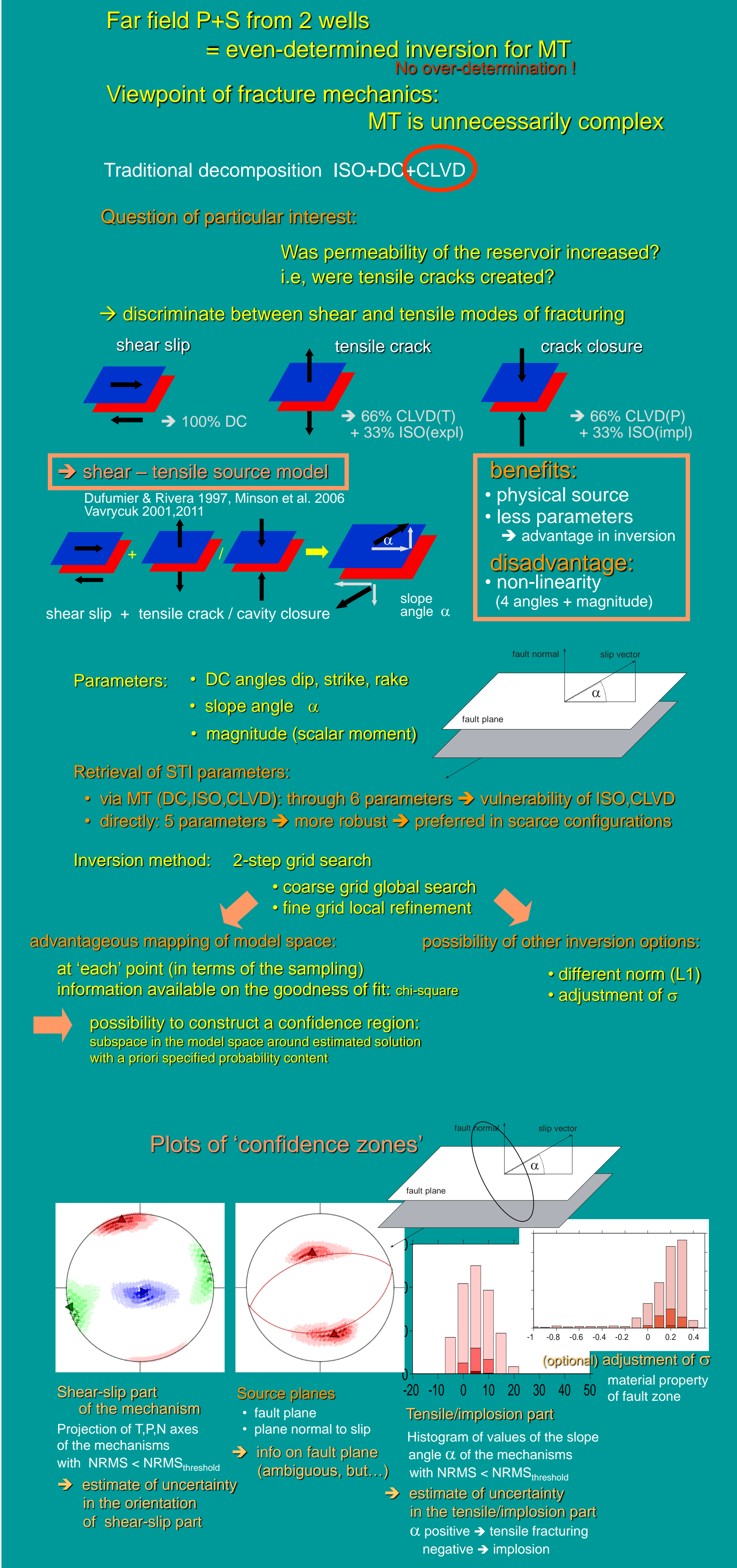


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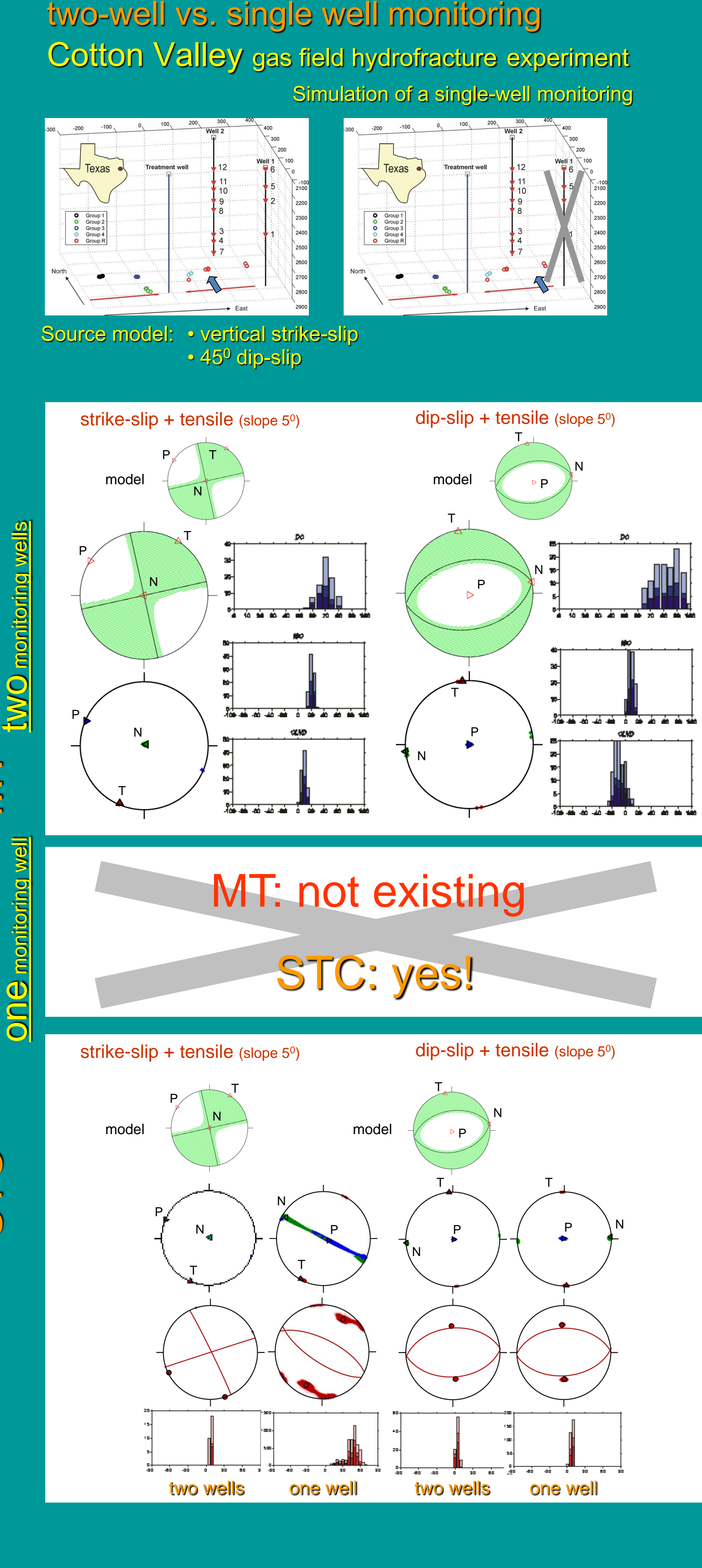
Motivation: hydrofracturing of oil/gas wells



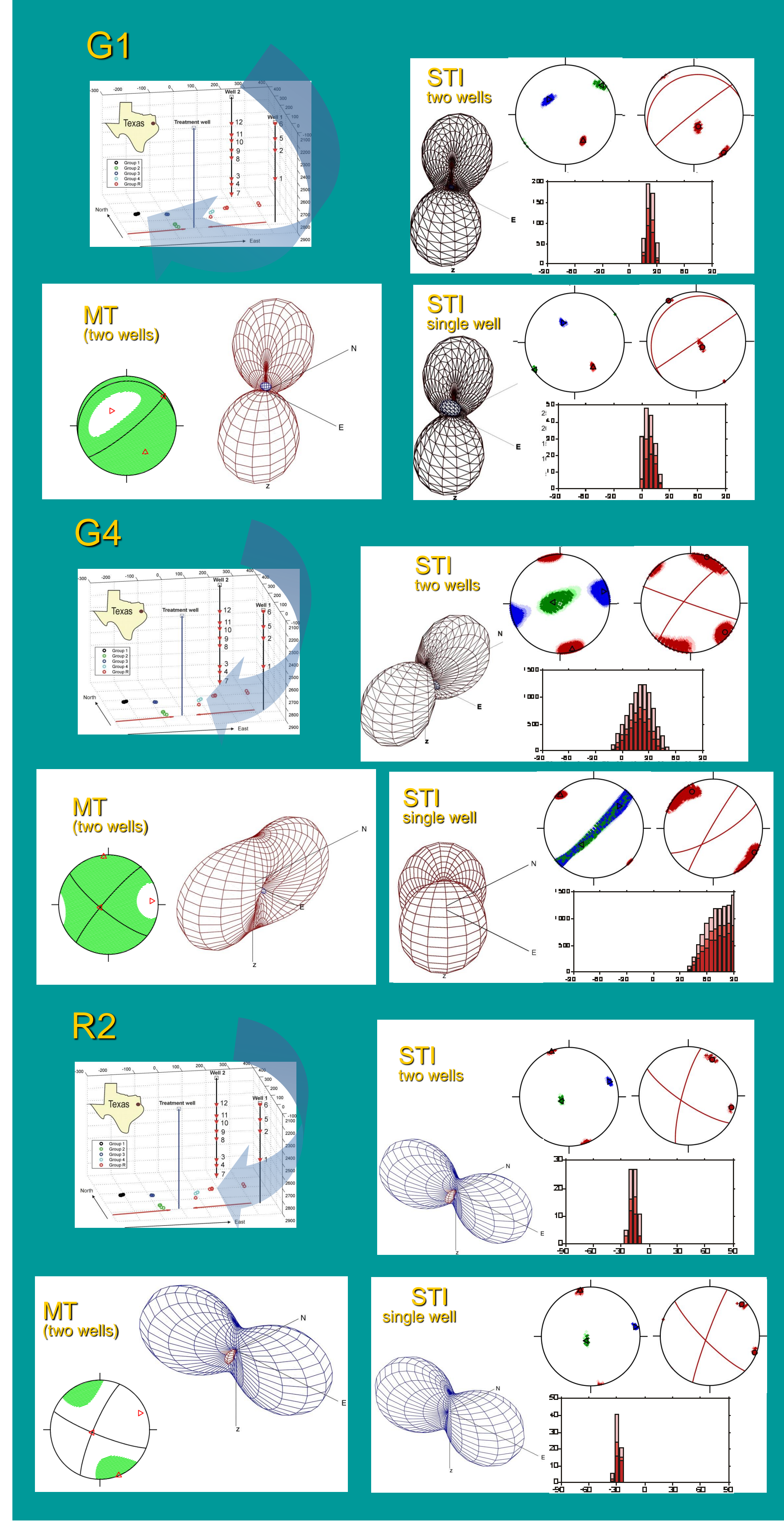
Design of shear-tensile crack (STC)



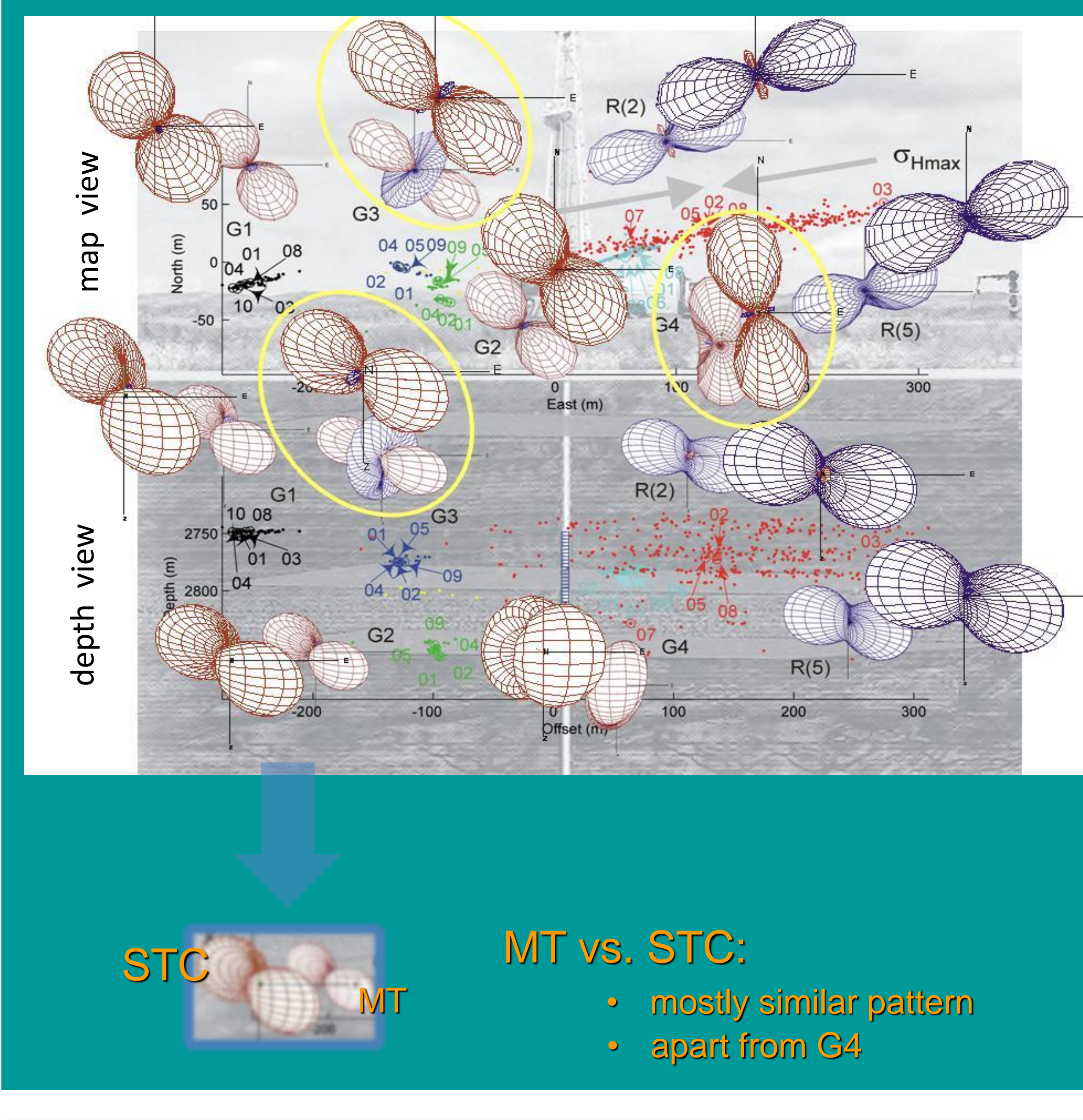
Synthetic testing of STC: two-well vs. single well monitoring



Re-processing of Cotton Valley



Re-processing of Cotton Valley: MT vs. STC



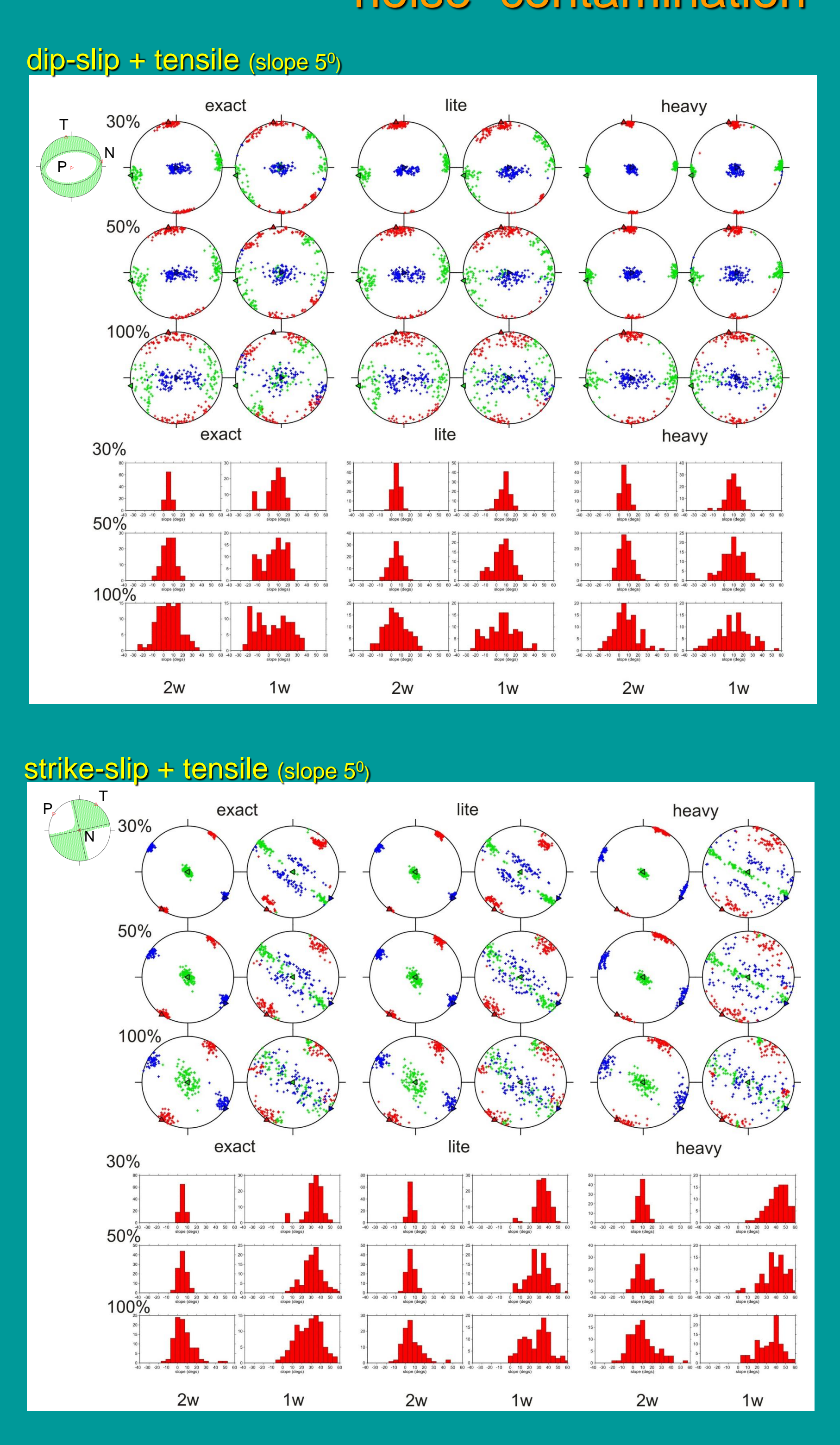
Conclusions:

MT: general description of a dipole source but too general in case of a simple fracturing; hydrofracturing in oil/geothermal industry: opening/closing of tensile cracks

additional constraint helpful → STC model
less parameters than MT (5 vs. 6)
non-linear model → exploration of model space → advantage in estimate of uncertainty of the solution
• minimization in different norms
• estimate of Poisson constant

beneficial in deficient configurations in particular, single-well monitoring
robust even with:
• reasonable noise in data
• realistic mislocation
• slight velocity mismodelling

STC synthetic tests: noise contamination



Cotton Valley reprocessing into STC: two-wells vs. single-well solutions

