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UQ Centre for Natural Gas

New geostatistics to model heterogeneity – The Copula Plug-in

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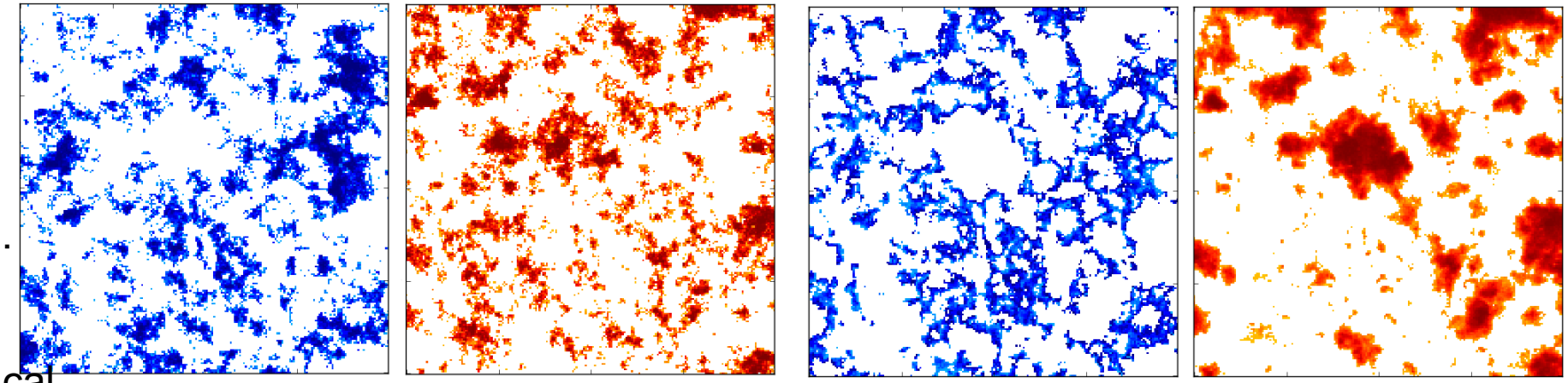
Non-linear geostatistics

The difference between the spatial structures becomes more apparent when dividing them up into their high and low values…

2 spatial fields with similar features but different structures…

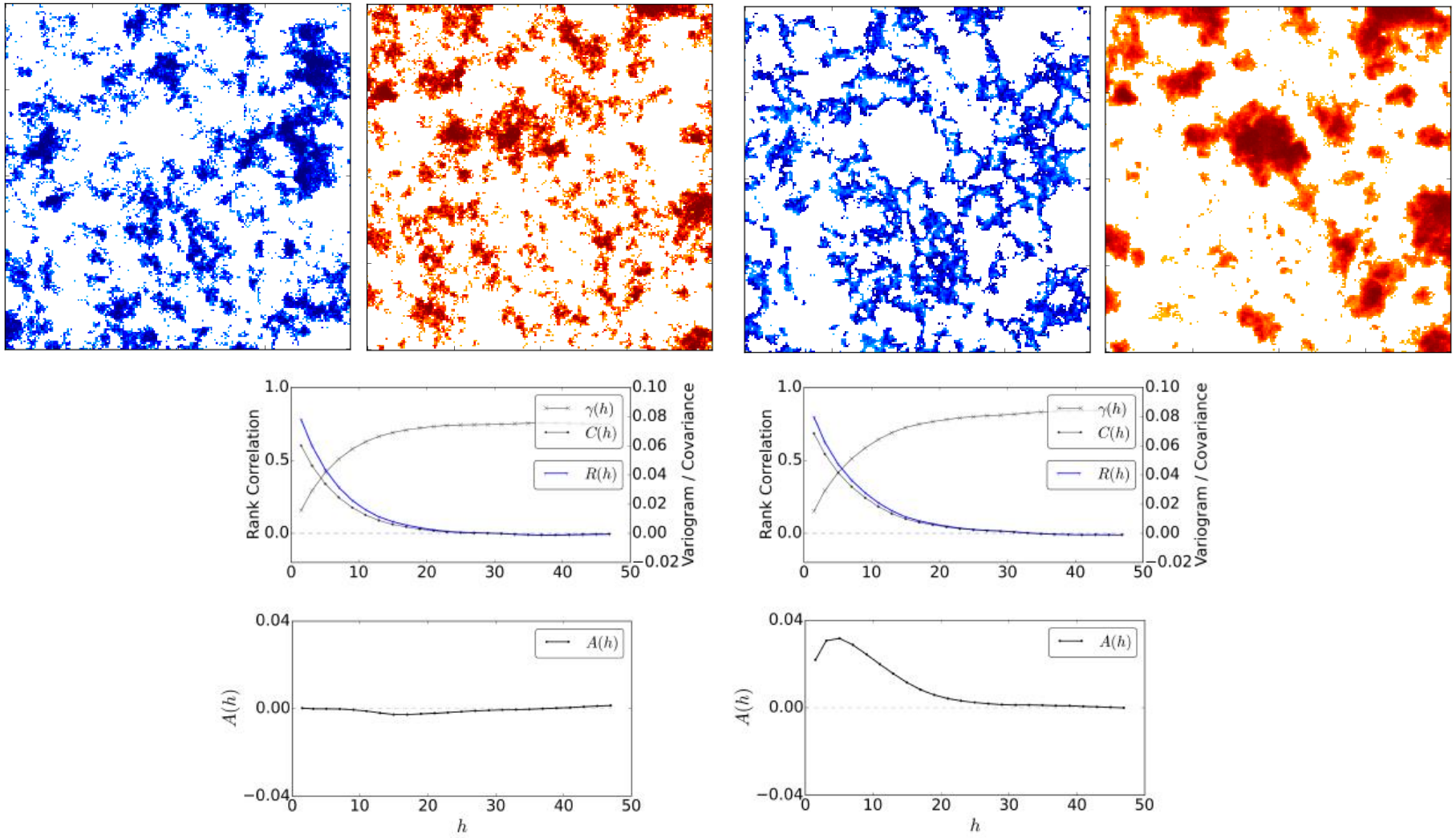


… both share identical values and nearly identical variograms (Why?? -> variogram = average description of spatial dependence)

…and it can be quantified using the spatial asymmetry function

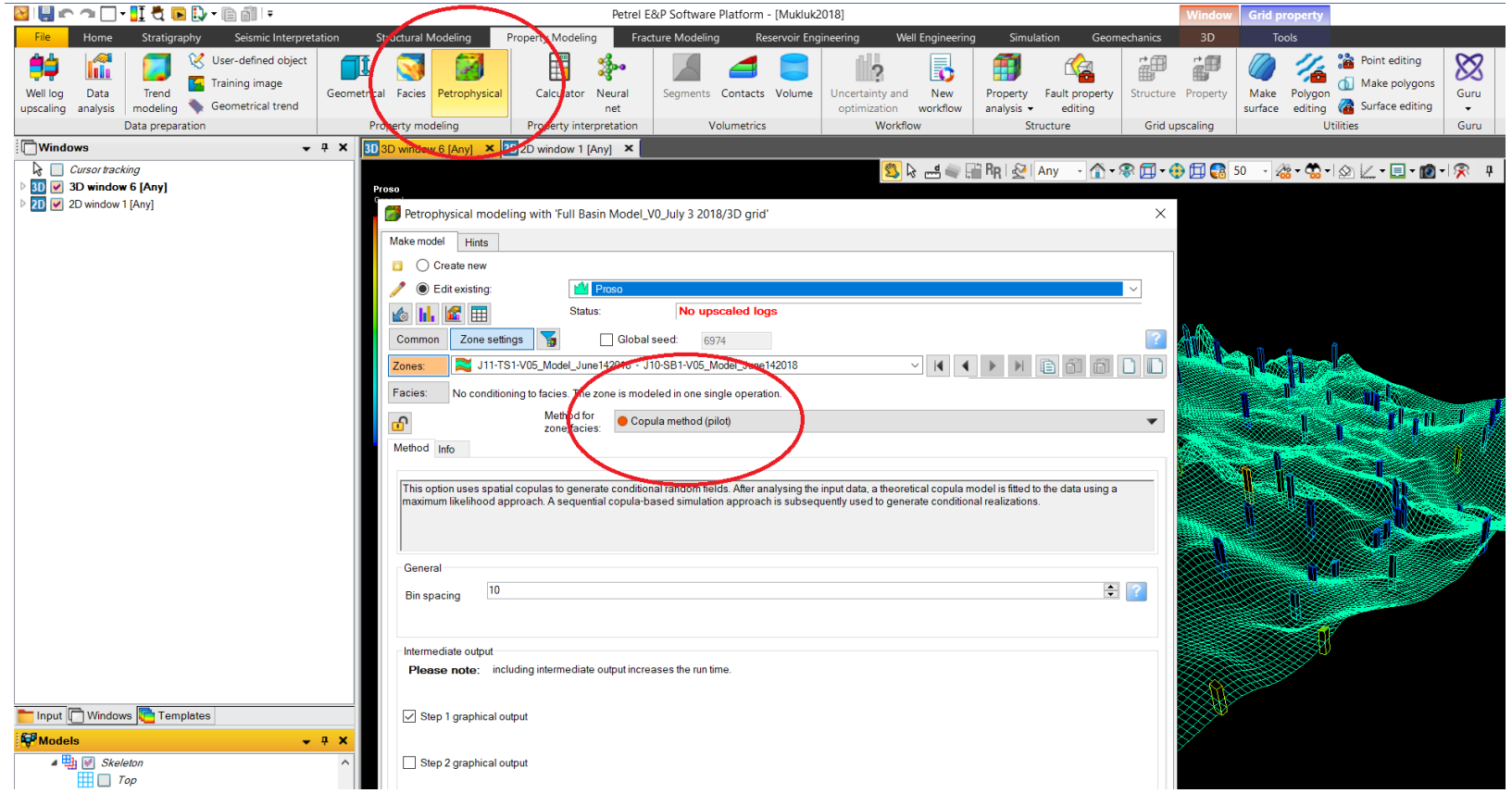
Non-linear geostatistics

This spatial asymmetry can have a massive impact on flow and transport processes (as connected/disconnected extreme values dominate flow behaviour), however traditional geostatistics are not able to describe nor model such asymmetric spatial structures.

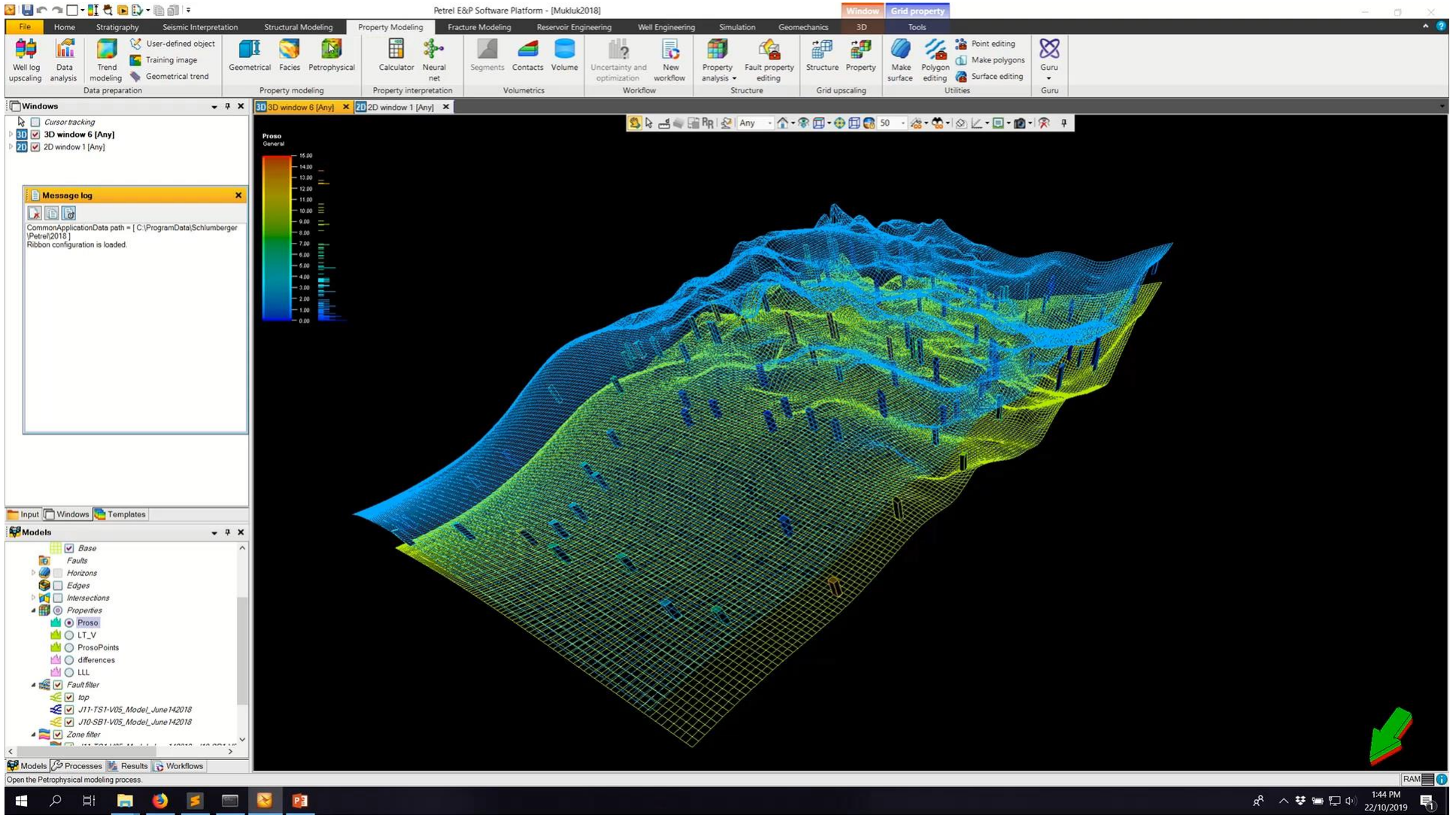


The copula plug-in

Spatial copulas (a special type of multivariate distribution function) allow modelling of spatial asymmetry. To make this technique available to a broader audience, UQ Centre for Natural Gas has collaborated with NERA to implement copula geostatistics as a Petrel Ocean Plug-in.



The copula plug-in



Thank you

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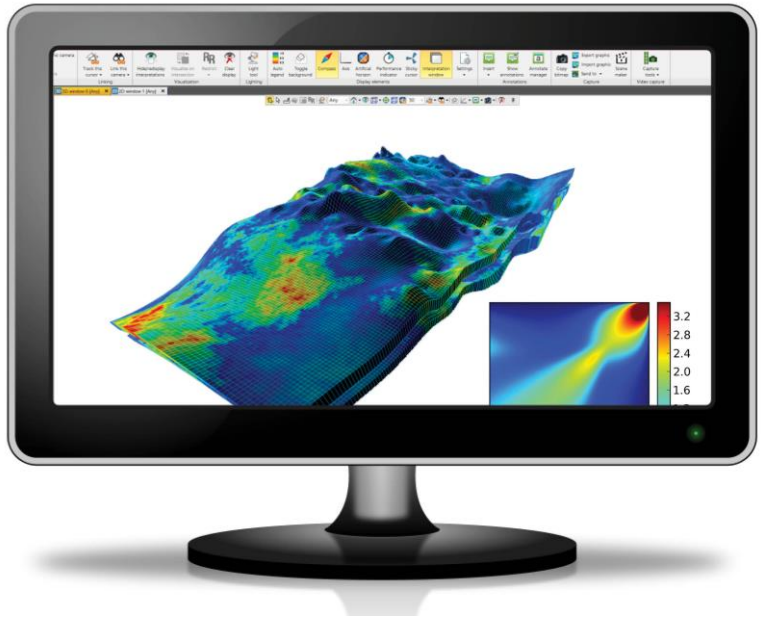

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