

Tomáš Mrkvička

Several new issues about global envelope tests

Joint with Mari Myllymäki, Samuel Soubeyrand, Ute Hahn

The rank and directional quantile envelope tests (Myllymäki et al., Global envelope tests for spatial processes, J. R. Statist. Soc. B, Accepted for publication) are proposed as a solution to multiple testing problem for Monte Carlo tests. Three new issues about these global envelope tests, which have an appropriate type I error probability and graphical interpretation, will be discussed in this talk.

- In addition to the test based on a classical one-dimensional summary function, the goodness-of-fit of a point process model will be evaluated by means of the test based on a higher dimensional functional statistic, namely a two-dimensional smoothed residual field.
- Combining of rank envelope tests with various test functions into one test is a useful tool. However, when the simulation from the null model is time consuming, such a procedure can last long. For such a case, combining of several directional quantile envelope tests with its new global graphical envelope representation will be proposed, to save the time.
- Several envelope tests can be combined by the rank test, but also by classical multiple testing procedures (e.g. Bonferroni correction or false discovery rate). A power comparison of these procedures will be presented, with the result that the rank test was the most powerful choice. The rank test also allows the global graphical interpretation over all envelope tests.