Generalized Probability - Probability Plots

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We introduce generalized Probability - Probability plots in order to study one- and two-sample problems on the line. These plots are indexed by the class of closed intervals, globally preserve the properties of the classical P-P plots and are distribution-free under the null hypothesis. Next we define the generalized P-P plot process and use it to obtain the test statistic. Consequently, the test statistic is distribution-free under the null hypothesis and consistent against all fixed alternatives. We also study the case of the contiguous alternatives and derive the limiting distribution of the test statistic, using the theory of empirical processes. The interesting case appears to be the contiguous alternatives of somewhat unusual behaviour, since the proposed test statistic resembles the classical scan statistic by its structure. Hence the spike alternatives are natural to consider, see also Khmaladze (1998). Through the simulation study we compare the performance of the chosen test statistic with different statistics for fixed and contiguous alternatives.

Presented results are based on the joint work with John H.J. Einmahl.

References

- Khmaladze, E. V. (1998). Goodness of fit tests for "Chimeric" alternatives. *Statist. Neerlandica* **52**, 90–111.