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Multivariate anomaly detection for Earth observations: a comparison of algorithms and feature extraction techniques

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Supplementary Material 1 Parameterization of Recurrences and Kernel Density Estimation

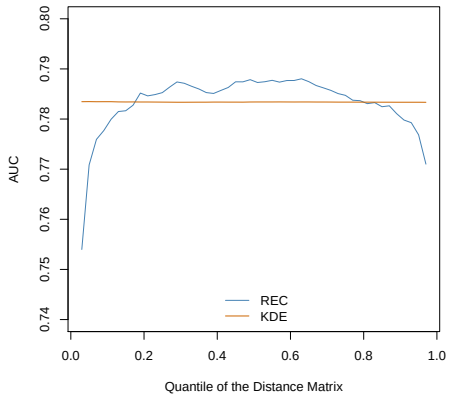

Figure S1. We test different choices of σ (Recurrences (*REC*)) or ε (for Kernel Density Estimation (*KDE*)) in a small simulation (500 repetitions) trying to detect a BaseShift. σ (or ε, respectively) is varied between the 0.05 and 0.95 quantile of the distribution of values of the distance matrix. The Area Under the receiver operator characteristics Curve (*AUC*) is computed for each parameterization. Results exhibit constant *AUC* values for *KDE* within the testing range of σ. In contrast *REC* is more sensitive to the choice of ε, although it might yield slightly higher *AUC* values in case of optimal chosen ε.

Supplementary Material 2 Effect of different data properties on the algorithms

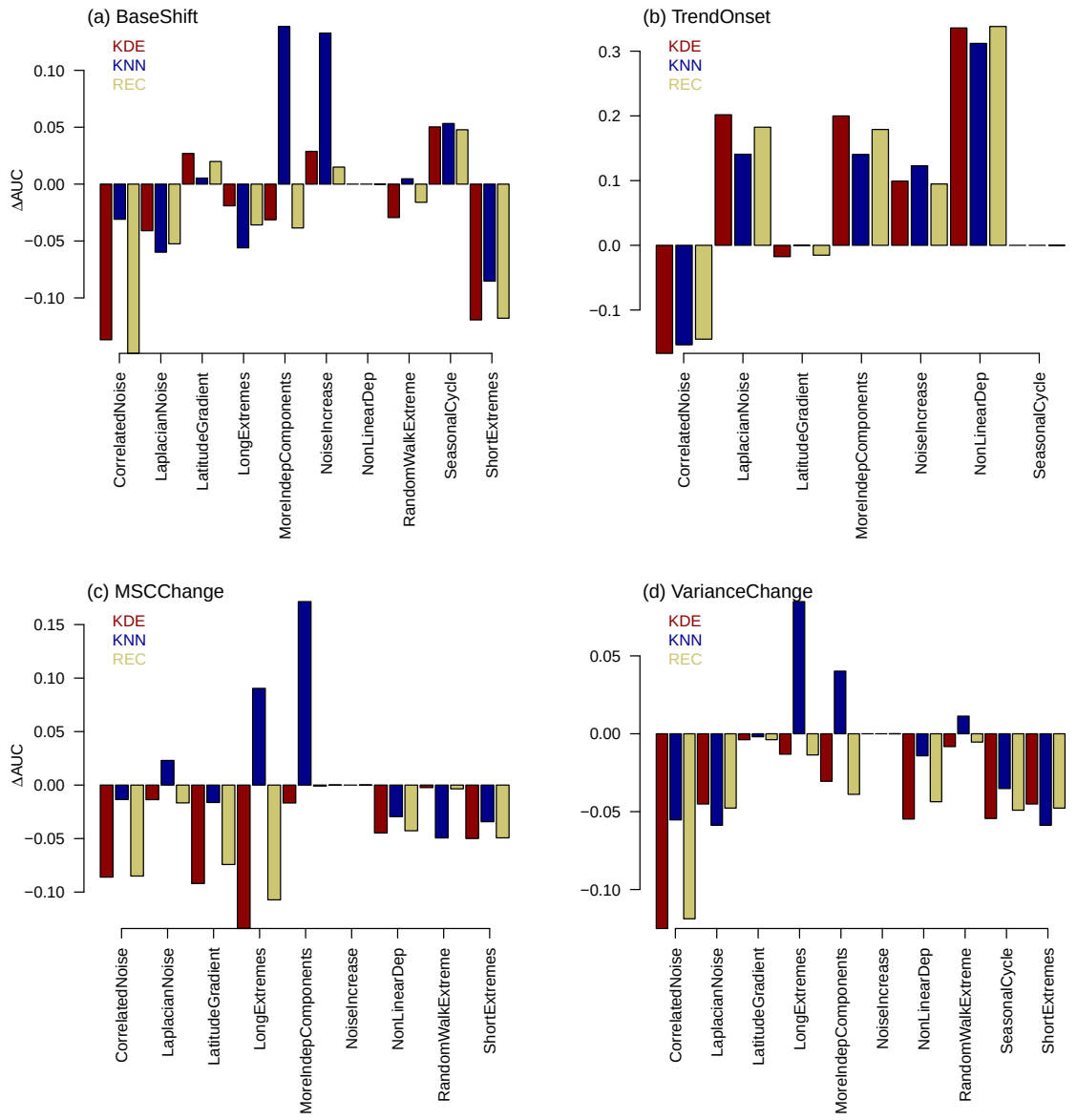

Figure S2. Effect of different data properties on the 3 best detection algorithms (KDE, REC, KNN-Gamma) presented as AUC difference to the UNIV control for the event types (a-d). Details for each algorithm reveal that KNN-Gamma is often less affected by 'difficult' data properties like CorrelatedNoise or MoreIndepComponents, i.e. KNN-Gamma is more adaptive than the other two algorithms.