3 Results

1. The Runge model. The system is a well-defined context. For the chemical reaction to be of interest, the parameter values $\alpha$ and $\beta$ were chosen from the parameter map. Thus, a system with parameters $\alpha = 0.33$ and $\beta = 0.1$ was chosen. The BDS-test was applied for each of the noise levels. The figure shows the result for $\alpha = 0.33$ and $\beta = 0.1$. The BDS-test confirms that the deterministic structure of the system has slightly been influenced.

2. The BDS-test models the data. Our noise cleaning algorithm has been used for this data of a model of a recurrent neuronal network [6]. As a reference, a purely deterministic chaotic system with distorted moments has been considered. The noise cleaning algorithm has been applied to the model data (red) and the reference data (blue). The resulting signal shows a clear difference between the two datasets. The BDS-test confirms the presence of noise and that the deterministic structure of the system has been slightly disturbed.

4 Discussion

Noise is a relevant problem. The noise cleaning algorithm has been used in time series analysis. It can only successfully be applied when the noise level is such that the deterministic structure of the system is not significantly altered. However, if the noise level is too high, the algorithm fails to recover the deterministic structure.

5 Literature