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# A spatio-temporal analysis of US station temperature trends over the last century

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This study presents a nonlinear spatio-temporal analysis of 1167 station temperature records from the United States Historical Climatology Network covering the period from 1898 through 2008. We use the Empirical Mode Decomposition (EMD) method to extract the generally nonlinear trends of each station. The statistical significance of each trend is assessed against three null models of the background climate variability, represented by stochastic processes of increasing temporal correlation length. We find strong evidence that more than 50 percent of all stations experienced a significant trend over the last century with respect to all three null models. A spatio-temporal analysis reveals a significant cooling trend in the South-East and significant warming trends in the rest of the contiguous US. It also shows that the warming trend appears to have migrated equatorward and possibly also in altitude. This shows the complex spatio-temporal evolution of climate change at local scales