

School of Mathematics and Physics Women in Mathematics Day

Nonstationary- Extremal modelling in weather systems

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Abstract:

Extremes in weather can often take the form of a hurricane, flood, or heat-wave. A better understanding of how large and frequent these events will be can influence evacuation procedures and inform preventative measures. We briefly discuss modeling extremes of dynamical systems in the classical i.i.d. setting. Classical results of extreme value theory extend naturally to dependent sequences provided the distribution of the sequence is stationary. In recent years, climate variability has caused changes in the distribution of weather observations. For example, we have shown that the mean and standard deviation of summer temperature extremes in Texas and Germany is increasing over time. We finish by discussing how machine learning techniques can allow us to obtain more accurate, time-dependent extremal models in these settings.