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Climate Extremes Workshop
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Lecture: *Max-Infinitely Divisible Models for Spatial Extremes Using Random Effects*

Speaker: Ben Shaby

Abstract:

Distinguishing between the subtly different dependence characteristics implied by current families of stochastic process models for spatial extremes is difficult or impossible based on exploratory analysis of data that is by definition scarce. Furthermore, different choices of extremal dependence classes have large consequences in the analysis they produce. I will present stochastic models for extreme events in space that are 1) flexible enough to transition across different classes of extremal dependence, and 2) permit inference through likelihood functions that can be computed for large datasets. These modeling goals will be accomplished by representing stochastic dependence relationships conditionally, which will induce desirable tail dependence properties and allow efficient inference through Markov chain Monte Carlo. I will present models for spatial extremes in the class of max-infinitely divisible processes, a generalization of the limiting max-stable class of processes which has received a great deal of attention. This work extends an old family of max-stable models based on a conditional hierarchical representation to the more flexible max-id class, thus accommodating a wider variety of extremal dependence characteristics while retaining the structure that makes it computationally attractive.