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On extreme value statistics of correlated random variables MAXIME CLUSEL, Laboratoire Coulomb, CNRS Université Montpellier 2, JEAN-YVES FORTIN, Institut Jean Lamour, CNRS Nancy-Universite — The statistics of extreme values of a set on independent and identically distributed random variables is a well established mathematical theory that can be traced back to the late 1920s, with pioneering work by Fisher and Tippett. While efforts have been made to go beyond the uncorrelated case, little is known about the extremes of strongly correlated variables. Notable exceptions are the distribution of extreme eigenvalues of random matrices (Tracy and Widom 1994), the Airy law for one-dimensional random walks (Majumdar and Comtet 2005), and random variables with logarithmic interactions (Fyodorov and Bouchaud 2008). We propose to adapt the equivalence between extremes and sums (Bertin and Clusel 2006) to obtain asymptotic distributions of correlated random variables. We will show how this approach works in the logarithmic case, before extending it to power-law correlations and beyond. We will eventually illustrate these cases with a simple model, a one-dimensional gas of interacting particles.

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