Geometry, Differential Invariants and Improved Tail Risk Measurement

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A new geometric invariant explains and unifies the landmark results of Extreme Value Theory, revealing the role of symmetry in the separation of domains of attraction and in a duality between Extreme Value and Generalised Pareto distributions.This invariant also provides an intrinsic measure of the rate of convergence of tails of probability distributions to their Extreme Value limits.

Tail models that converge rapidly over quantile ranges that are practical in financial applications are highly efficient at measuring risk from financial time series. Some recent examples include 'flash crashes', prediction of the 'Short VIX' meltdown and multi-day drawdown risk in European bank share prices.