CONDITIONAL VARIANCE FOR STABLE RANDOM VECTORS

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Abstract: For a symmetric α-stable random vector $(X_1, \ldots, X_n, X_{n+1})$ with $1 < \alpha < 2$ and spectral measure Γ, we find a necessary and sufficient condition in terms of Γ for the conditional variance $\mathrm{Var}(X_{n+1} | X_1, \ldots, X_n)$ to be finite. We express the conditional variance in terms of Γ, and we develop an additivity property when $X_1, \ldots, X_n$ are independent. These results are then applied to stable processes: scale mixtures of Gaussian processes, harmonizable and moving averages.

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