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PREDICTION OF INFINITE VARIANCE FRACTIONAL ARIMA

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Abstract: We establish conditions for the existence and invertibility of fractionally differenced ARIMA time series whose innovations are in the domain of attraction of an α-stable law with $\alpha < 2$ and consequently have infinite variance. More importantly, we study the effect of truncation on the minimum dispersion linear predictor of X_{n+k} based on the infinite past $X_n, X_{n-1}, \ldots$ We verify that the truncated predictor $\hat{X}_{n+k}$ based on the *finite* past $X_n, \ldots, X_0$ is asymptotically efficient, and derive asymptotic bounds on the rate of convergence to 1 of the efficiency of $\hat{X}_{n+k}$. The bounds are shown to decay like power functions with the rate of decay depending on the index of stability α and the difference parameter d.

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