Linear systems: a white noise approach

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Using the white noise setting, in particular the Wick product, the Hermite transform, and the Kondratiev space, we present a new approach to study linear stochastic systems, where randomness is also included in the transfer function. We prove BIBO type stability theorems for these systems, both in the discrete and continuous time cases. We also consider the case of dissipative systems for both discrete and continuous time systems. We further study ℓ_1-ℓ_2 stability in the discrete time case, and $\mathbf{L}_2$-$\mathbf{L}_\infty$ stability in the continuous time case.