

Smoothness Properties of Spatial-Temporal Models

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Recently several efforts have been made to model stationary spatial-temporal processes. Each approach proposed in the literature, and some developed in this paper, leads to a significant amount of overlapping models. In this paper, first we attempt to give a unified representation of stationary spatial-temporal models in three different domains namely the observation, frequency and "half-spectral" domains. Second, we develop new classes of stationary spatial-temporal models which are more general than recently presented models. Further we give a deeper insight into some properties of spatial-temporal models in these three domains. To illustrate analytical findings, results of numerical calculations and numerous plots are presented.