COLLOQUIUM
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When does the screening effect hold?

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Abstract

When using optimal linear prediction to interpolate point observations of a mean square continuous stationary spatial process, one might generally expect that the interpolant mostly depends on those observations located nearest to the predictand. This phenomenon is in fact commonly observed in practice and is called the screening effect. However, there are situations in which a screening effect does not hold in a reasonable asymptotic sense and theoretical support for the screening effect is limited to some rather specialized settings for the observation locations. This talk explores conditions on the observation locations and the process model under which an asymptotic screening effect holds. A series of examples shows the difficulty in formulating a general result, especially for processes with different degrees of smoothness in different directions, which can naturally occur for spatial-temporal processes. These examples motivate a general conjecture and I describe two theorems covering special cases of it. The key condition on the process is that its spectral density should change slowly at high frequencies. I will argue that models not satisfying this condition of slow high-frequency change should generally not be used in practice.

To request an interpretor or other accomodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.