Spatial Wave Size for Gaussian Random Fields

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Abstract

A method of measuring three-dimensional spatial wave size is proposed and statistical distributions of the size characteristics are derived in explicit integral forms for Gaussian sea surfaces. New definitions of wave characteristics such as the crest-height, the length, the size and the wave front location are provided in fully dimensional context. The joint statistical distributions of these wave characteristics are derived using the Rices formulas for expected numbers of local maximum and distance from a local maximum to a level crossing contour. Review of the Rice's method to study crossing distributions is given.

References

1. K. Podgorski and I. Rychlik. Spatial wave size for Gaussian random fields. Spatial wave size for Gaussian random fields, working paper..