# ALIASING EFFECTS AND SAMPLING THEOREMS OF SPHERICAL RANDOM FIELDS WHEN SAMPLED ON A FINITE GRID

TA-HSIN LI[1] AND GERALD R. NORTH[2]

[1] *Department of Statistics, Texas A&M University, College Station, TX 77843, U.S.A.*
[2] *Climate System Research Program, Department of Meteorology, Texas A&M University, College Station, TX 77843, U.S.A.*

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**Abstract.** Aliasing effects are investigated for spherical random fields sampled on a finite grid. Using the spherical harmonics expansion, it is shown that for a band-limited spherical random field its trend and spectrum can be uniquely reconstructed from the sampled field if the sampling points are judiciously designed. Analytical expressions are also obtained for aliasing errors in the trend and the spectrum when the field is not band-limited.

*Key words and phrases*: Gauss quadrature, Laplace series, sampling theorems, spectral analysis, spherical harmonics.