

Multiresolution Analysis and Wavelets on S^2 and S^3

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Abstract

In this paper, we construct a multiresolution analysis and a wavelet basis on two specific compact manifolds. Using special charts, the problem is reduced to finding appropriate nested spaces on rectangular domains. The claim of C^1 -continuity gives rise to certain boundary conditions on the rectangles. To satisfy these conditions, we use a tensor product approach in which one factor is an exponential spline.

Key Words: Multiresolution analysis, wavelets, tensor splines, exponential splines, surfaces on surfaces.

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