

Lecture Notes in Mathematics 2044

Kendall Atkinson · Weimin Han

## Spherical Harmonics and Approximations on the Unit Sphere: An Introduction

These notes provide an introduction to the theory of spherical harmonics in an arbitrary dimension as well as an overview of classical and recent results on some aspects of the approximation of functions by spherical polynomials and numerical integration over the unit sphere. The notes are intended for graduate students in the mathematical sciences and researchers who are interested in solving problems involving partial differential and integral equations on the unit sphere, especially on the unit sphere in three-dimensional Euclidean space. Some related work for approximation on the unit disk in the plane is also briefly discussed, with results being generalizable to the unit ball in more dimensions.

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