

1030-42-159

Xiaoping Shen* (shen@math.ohiou.edu), Department of Mathematics, Ohio University, Athens, OH 45701. *Lagrange Interpolation by Periodic Prolate Spheroidal Wavelets*. Preliminary report.

The periodic prolate spheroidal wavelets (PPSWs) possess certain interesting properties lacking in other periodic wavelets. In particular, in common with trigonometric functions, PPSWs are natural candidates for lacunary interpolation. In this talk, we introduce Lagrange interpolation for functions in $C[0,1]$ at equal spaced dyadic mesh points using PPSWs. By constructing the Lagrange-PPSW fundamental interpolating functions, we obtain the existence and uniqueness of the solution to the interpolation problem. We then discuss properties of the Lagrange-PPSW interpolation and related numerical issues. Numerical examples are given to illustrate the theoretical results. (Received July 31, 2007)