FENG DAI, University of Alberta, Edmonton, Alberta

An inequality on m-term approximation by ultraspherical polynomials and its applications

In this talk, I shall show a useful inequality on m-term approximation by ultraspherical polynomials on $[-1, 1]$. As an application, I shall show how to use this inequality to construct a sequence of polynomials ψ_j, $j = 1, 2, \ldots$ with the following properties:

(i) $\psi_j \in \operatorname{span}\{P^\lambda_{2^{j-1}+1}, P^\lambda_{2^{j-1}+2}, \ldots, P^\lambda_{2^j}\}$, where P^λ_k denotes the usual ultraspherical polynomial of degree k and index λ on $[-1, 1]$.

(ii) $\|\psi_j\|_{2,\lambda} \approx \|\psi_j\|_\infty$ with the constant of equivalence independent of j, here $\|\cdot\|_{2,\lambda}$ denotes the L^2 norm on $[-1, 1]$ computed with respect to the weight $(1 - t^2)^\lambda$.