ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

8. Analysis

1991 MS Classification: 42
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Distribution function inequalities for sums of wavelets

Sums of Haar functions are just dyadic martingales. Associated to a dyadic martingale are two functions: its maximal function and its square function. These have equivalent L^p norms and in fact satisfy certain inequalities which relate their distribution functions. These so-called good–λ inequalities easily imply the L^p equivalence and more. Haar functions are the simplest example of wavelets; we show that these ideas can be generalized to that setting. That is, under certain conditions, we can create wavelet maximal functions and square functions and show good–λ inequalities relating their distribution functions.