HYPERGRAPH REPRESENTATION AND BOUNDEDNESS OF ENTANGLED MULTILINEAR FORMS

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Entangled multilinear singular integral forms have been studied by several authors over the last ten years. They recently found applications in ergodic theory [3], in arithmetic combinatorics [2], to stochastic integration [7], and within the harmonic analysis itself [4]. Therefore, it would be useful to have a reasonably general theory establishing (or characterizing) L^p bounds for these objects. As a step in this program we take a result of Kovač [5], where the forms are dyadic and indexed by bipartite graphs, and generalize it to r-partite r-uniform hypergraphs. Some higher-dimensional instances were already discussed by Kovač [6] and Durcik [1], but our hypergraph generalization prefers a combinatorial description of the structure over a geometric one. Consequently, we can study less symmetric entangled forms and show their estimates in an open range of L^p spaces.

This is a joint work with Vjekoslav Kovač (University of Zagreb).

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