FRACTIONAL MATCHINGS IN HYPERGRAPHS AND THEIR APPLICATIONS

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We discuss degree conditions which guarantee the existence of perfect matchings and perfect fractional matchings in uniform hypergraphs. We reduce this problem to a conjecture of Erdös about the maximum number of edges in a hypergraph when the (fractional) matching number is given. We are able to solve it asymptotically in some special cases using probabilistic techniques. In particular, we asymptotically determine the minimum vertex degree which guarantees a perfect matching in 4-uniform and 5-uniform hypergraphs. We also discuss an application to the problem of finding an optimal data allocation in the distributed storage system. (This is joint work with Alon, Frankl, Huang, Rodl, and Sudakov.)