1073-05-69 **John Goldwasser*** (`jgoldwas@math.wvu.edu`) and **John Talbot**. *Vertex Ramsey problems in the hypercube.*

We think of the vertices of the n-cube as the set of all subsets of 1,2,3,…,n. We say a subset S of the vertices of the d-cube is t-cube-Ramsey if for sufficiently large n, whenever the vertices of the n-cube are colored with t colors, there must be an embedded monochromatic copy of S. If all sets in S have the same size, then it follows immediately from Ramsey's theorem that S is t-cube-Ramsey, for all t. If S contains sets of different parities then it is not 2-cube-Ramsey, because of the all odd size vertices red and all even size vertices blue coloring. In general it is quite difficult to determine if a set S is t-cube-Ramsey. We determine which sets S which are the union of two or three vertex disjoint cliques are 2-cube-Ramsey. We use the Lovasz local lemma to show that no set which is the union of at least 40 vertex disjoint cliques can be 2-cube-Ramsey. We say a t-coloring of the vertices of the d-cube is layered if all the vertices of the same size get the same color. A key ingredient in our proofs is the following: For each positive integer d, there exists a positive integer N such that for each n greater than N, in every t-coloring of the vertices of the n-cube there is an embedded copy of a d-cube with a layered coloring (Received July 26, 2011)