1171-05-244 Alexander J. Clifton* (aclift2@emory.edu). Almost k-coverings of grids.

Alon and Füredi determined the minimum number of affine hyperplanes needed to cover all but one point of an *n*-dimensional rectangular grid. We extend this question to the case where all grid points must be covered at least k times, except for one which is not covered at all. Using the Punctured Combinatorial Nullstellensatz of Ball and Serra, we solve this question for k = 2. In the special case where the grid is a hypercube, we solve the problem completely for k = 3 and establish a nontrivial lower bound when k > 3.

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