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Oliver T.B. Meldrum* (ooliveair@gmail.com). *Maximizing the number of vertices of the d -cube that can be covered by a ball of given radius.* Preliminary report.

We consider the problem of finding the maximum number of vertices of a unit d -dimensional hypercube that can be covered by a hypersphere of radius r . We give solutions for ($d \leq 6$) and ($r^2 < \frac{45}{44}$) and provide some bounds on the solution in general. Finally, we disprove many natural conjectures, showing that this problem, despite its elementary statement, appears to have a surprisingly complicated solution. (Received September 25, 2018)