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On the density of finitely many unit balls relative to their outer parallel domain

We propose to study the following "free" packing problem: Let $n > 1$ be a positive integer and let $r > 0$ be a positive real. Then for a given integer $d > 1$ find the packing of n unit balls in d-dimensional Euclidean space whose density relative to the outer parallel domain of their union having radius r is as large as possible. We give estimates in terms of n, r and d.