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Joerg Wills* (wills@mathematik.uni-siegen.de), Prof. Dr. Joerg M. Wills, University of Siegen, FB 6, ENC, Mathematical Department, 57068 Siegen, Germany. *On the Dimension of dense Sphere Packings*. Preliminary report.

Let B^d denote the unit ball in Euclidean d -space E^d and $D \subset E^d$ a finite discrete set such that $D + B^d$ is a packing of $n = \text{card } D$ balls. We call $\dim \text{conv} D$ the dimension of the packing. For given $d \geq 2, n \geq 2$ and $\rho > 0$ we call a sphere packing $D + B^d$ dense, if the weighted volume $\frac{1}{n}V(\text{conv} D + \rho B^d)$ is minimal. **Conjecture:** *Dense sphere packings have extremal dimension*

(i.e. $\dim \text{conv} D$ is either 1 or d , or $n - 1$ for $n \leq d$). Several partial results by Arhelger, Betke, Böröczky jr., Gritzmann, Henk, Schnell, Schuermann, Wills support this conjecture; but the general problem is still open. (Received September 28, 2000)