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Gaston A. Brouwer, Jonathan Joe and Matt Noble* (matthew.noble@mga.edu). *Odd
Vector Cycles in \mathbb{Z}^m .*

For positive integers m , n , and r with n odd, define an *odd vector cycle* as $v_1, \dots, v_n \in \mathbb{Z}^m$, each of magnitude \sqrt{r} , that together sum to the zero vector. Denote by $C_m(r)$ the minimum n where such a collection of vectors exists. In this talk, we will detail our efforts to determine $C_m(r)$ for all possible assignments of m, r . Along the way, we will briefly touch upon binary quadratic forms, Euclidean distance graphs, algorithmic search results, and who knows what else. In closing, we will relate a number of (to the best of our knowledge) open questions that have arisen during the work. (Received January 28, 2019)