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Thomas A Carlson* (eltsyth@ms.washington.edu). *The Edge-Isoperimetric Problem for Discrete Tori.*

The edge-isoperimetric problem has long been solved for cartesian powers of the cycles C_3 and C_4 , for which the lexicographic order is the optimal order, and powers of the cycles C_n with $n > 5$, which don't have nested optimal subsets. For powers of C_5 , it is clear that the lexicographic order is not optimal. We present a solution to the edge-isoperimetric problem for powers of C_5 in the form of an optimal order for the vertices. We then prove that discrete tori of the forms $C_5^i \times C_4^j \times C_3^k$ and $C_n \times C_5^i \times C_4^j \times C_3^k$ have nested optimal subsets for $n > 5, i, j, k \geq 0$, and give an optimal order for members of that class. We conjecture that these are the only discrete tori which have nested optimal subsets. (Received September 12, 2000)