

# On the connectivity of the Vietoris-Rips complex of a hypercube graph

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The Vietoris-Rips complex  $VR(Q_n; r)$  of a hypercube graph  $Q_n$  is the simplicial complex with vertices the binary strings of length  $n$  and simplices  $\{v_0, \dots, v_k\}$ , where the Hamming distance between every pair of vertices  $v_i$  and  $v_j$  is at most  $r$ ; i.e.  $v_i + v_j$  modulo 2 has at most  $r$  ones. It is known that  $VR(Q_n; r)$  is  $(2^r - 2)$ -connected for  $r = 1, 2, 3$ . We give a lower bound for the connectivity of  $VR(Q_n; r)$  for  $r \geq 4$ .