Dominance Codes in the Square of the Hypercube

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Given a number $n > 1$, a n–bit code is a sequence $a0a1...$ an with elements in $\{0, 1\}$. The weight of a n–bit code is the number of ones that it contains. The distance of two n–bit codes is the number of positions in which they are different. A n–bit code A dominates to other n–bit code B if and only if B has cero in all the positions where A has cero. The graph $En(On)$ is the graph having the n–bit codes of even (odd) weight, and two vertices are joined by an edge if and only if the distance between them is two and one bit code dominates the other. We study the hamiltonicity of these graphs, of the graphs obtained when we omit the distance–two condition and give some combinatorial applications.