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2-Limited Packings of Cartesian Products

For a fixed integer k, a set of vertices B of a graph G is a *k-limited packing* of G provided that the closed neighourhood of any vertex in G contains at most k elements of B. The size of a largest possible k-limited packing in G is denoted $L_k(G)$ and is the k-limited packing number of G. In this talk, we investigate the 2-limited packing number of Cartesian products of paths. We show that the function $\Delta[L_2(P_m \Box P_n)] = L_2(P_m \Box P_n) - L_2(P_m \Box P_{n-1})$ is eventually periodic, and thereby give closed formulas for $L_2(P_m \Box P_n)$, $m = 1, 2, \ldots, 5$. The techniques we use are suitable for establishing other types of packing and domination numbers for Cartesian products of paths and, more generally, for graphs of the form $H \Box P_n$. This is joint work with Robert P. Gallant.