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Minimal degree of the automorphism group of primitive coherent configurations

The minimal degree of a permutation group is the minimum number of points not fixed by non-identity elements. Lower bounds on this have structural consequences. In 2014 Babai proved that the automorphism group of a strongly regular graph with n vertices has linear minimal degree, with known exceptions. Strongly regular graphs correspond to primitive coherent configurations of rank 3. We extend Babai's result to rank 4. We also show that the result extends to non-geometric primitive distance-regular graphs of bounded diameter. The proofs combine structural and spectral methods. The results have consequences to primitive permutation groups previously known using CFSG.