

Towards a classification of 1-homogeneous graphs with positive intersection number a_1

Wednesday, 28 August 2024 17:00 (30 minutes)

Let Γ be a graph with diameter at least two. Then Γ is said to be 1-homogeneous (in the sense of Nomura) whenever for every pair of adjacent vertices x and y in Γ , the distance partition of the vertex set of Γ with respect to both x and y is equitable, and the parameters corresponding to equitable partitions are independent of the choice of x and y . Assume Γ is 1-homogeneous distance-regular with intersection number $a_1 > 0$ and diameter D

Define $b = b_1/(\theta_1 + 1)$, where b_1 is the intersection number and θ_1 is the second largest eigenvalue of Γ . In this talk, we show that if intersection number c_2

then b

and one of the following (i)–(vi) holds: (i) Γ is a regular near $2D$ -gon, (ii) Γ is a Johnson graph $J(2D, D)$, (iii) Γ is a halved ℓ -cube where $\ell \in \{2D, 2D + 1\}$, (iv) Γ is a folded Johnson graph $\bar{J}(4D, 2D)$, (v) Γ is a folded halved $(4D)$ -cube, (vi) the valency of Γ is bounded by a function of b . Moreover, we characterize 1-homogeneous graphs with classical parameters and $a_1 > 0$, as well as tight distance-regular graphs. This is a joint work with J. Koolen, M. Abdullah, B. Gebremichel.

Primary authors: KOOLEN, Jack (University of Science and Technology of China); ABDULLAH, Mamoon (University of Science and Technology of China); GEBREMICHEL, Brhane (University of Science and Technology of China); LEE, Jae-Ho (University of North Florida & POSTECH)

Presenter: LEE, Jae-Ho (University of North Florida & POSTECH)

Session Classification: Contributed Talk