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Geometric distance-regular graphs

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Geometric distance-regular graphs generalize the concept of geometric strongly regular graphs, (introduced by Bose) and were introduced by C. Godsil.

Neumaier showed that except for a finite number of exceptions all the strongly regular graphs with fixed smallest eigenvalue say -m are geometric.

Bang and Koolen showed that this is also true for distance-regular graphs under the additional condition that the intersection number c_2 is at least two.

Using the fact that the Bannai-Ito conjecture is true, i.e. for fixed k at least three there are finitely many distance-regular graphs, we show that the condition on c_2 can be removed.

This shows that geometric distance-regular graphs forms an important class of distance-regular graphs. In this talk I further will survey what is known about geometric distance-regular graphs and will mention several open problems and conjectures.