ROUX: A REFINED APPROACH TO ANTIPODAL COVERS OF COMPLETE GRAPHS

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Abstract

The concept of voltage assignment on graphs has been used to construct regular coverings of graphs. In particular, certain voltage assignments on the set of arcs of a complete graph give rise to antipodal distance-regular covers of complete graphs, as shown by Godsil and Hensel in 1992. Klin and Pech regarded voltage assignments on a complete graph on n vertices as an $n \times n$ matrix with entries in the group algebra in 2011, and it was axiomatized using the theory of association schemes by Iverson and Mixon in 2022. The terms roux matrix and roux scheme, introduced by Iverson and Mixon capture not only antipodal distance-regular covers of complete graphs, but also complex equiangular lines. In this talk, I will introduce the so-called local construction of roux schemes, and how the remarkable set of 64 equiangular lines discovered by Hoggar in 1998 can be characterized as an association scheme.

This is based on joint work with Jesse Lansdown, Alexander Gavrilyuk and Sho Suda.

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