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*Localization and the Ball Dimension*

In this talk we introduce a new variant of the metric dimension called the *ball dimension* as a tool for studying a multi-robber variant of the Localization game as well as the original Localization game. This new variant weakens the resolving condition of the metric dimension and only requires vertices which share a neighbour to be resolved. We will first explore connections between the metric dimension, ball dimension, and the Localization game. We will then use the ball dimension as a tool to explore bounds on the localization number for highly symmetric graphs, namely hypercubes, Johnson graphs, and Grassmann graphs. We also demonstrate a surprising connection between the ball dimension, Johnson graphs, and projective planes. We conclude with some open problems.

This is joint work with Trent Marbach and Kerry Ojakian.