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Scott Baldridge* (sbaldrid@math.lsu.edu), 224 Lockett Hall, Baton Rouge, LA 70803, and
Adam Lowrance. *Cube Diagrams: The Topology and Geometry of Knots in Three Dimensions.* Preliminary report.

In this talk we will introduce the notion of a cube diagram—a three dimensional representation of a knot in R^3 whose three planar knot projections are grid diagrams. The main goal in defining cube diagrams was to develop a data structure that describes an embedding of a knot in R^3 such that (1) every link is represented by a cube diagram, (2) the data structure is rigid enough to easily define invariants, yet (3) a limited number of 5 inherently 3-dimensional moves are all that are necessary to transform one cube diagram of a link into any other cube diagram of the same link.

As an example of the usefulness of cube diagrams we will present a homology theory constructed from cube diagrams and show that it is equivalent to knot Floer homology, one of the most powerful known knot invariants. (Received March 30, 2010)