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William C Kronholm* (wkronholm@whittier.edu), Department of Mathematics, Whittier College, Whittier, CA 90608. *On Homology Preserving Representations of Planar Rips Complexes*. Preliminary report.

In this preliminary report, we explore the following problem: Given a network of n nodes, can one choose coordinates x_1, \dots, x_n in \mathbb{R}^2 so that the projection of the Rips complex determined by the communication graph of the sensor nodes to \mathbb{R}^2 induces an isomorphism between the homology of the Rips complex and the homology of the image of the projection? Can the coordinates x_1, \dots, x_n be chosen so that the projection is an isomorphism for all possible communication graphs? If not, what additional information is needed to guarantee the projection induces an isomorphism?

This problem is inspired by a collaboration between artist and mathematician and the connection between the art and the mathematics will be discussed. (Received September 26, 2012)