

Rowmotion on Rooted Trees

Presenter

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Based on joint work with Pranjal Dangwal, Jinting Liang, Jianzhi Lou, Bruce Sagan, and Zach Stewart

A rooted tree T is a poset whose Hasse diagram is a graph-theoretic tree having a unique minimal element. We study rowmotion on antichains and lower order ideals of T . Recently Elizalde, Roby, Plante and Sagan considered rowmotion on fences which are posets whose Hasse diagram is a path (but permitting any number of minimal elements). They showed that in this case, the orbits could be described in terms of tilings of a cylinder. They also defined a new notion called homometry which means that a statistic takes a constant value on all orbits of the same size. This is a weaker condition than the well-studied concept of homomesy which requires a constant value for the average of the statistic over all orbits. Rowmotion on fences is often homometric for certain statistics, but not homomesic. We introduce a tiling model for rowmotion on rooted trees. We use it to study various specific types of trees and show that they exhibit homometry, although not homomesy, for certain statistics.