Tropical rank and topological dimension of tropical linear series

Lucas Gierczak[*][1]

[1]Institut de Mathématiques de Marseille – Aix Marseille Université, Ecole Centrale de Marseille, Centre National de la Recherche Scientifique, Centre National de la Recherche Scientifique : UMR7373, Ecole Centrale de Marseille : UMR7373, Aix Marseille Université : UMR7373 – France

Résumé

Given a metric graph G, tropical linear series are sets of real continuous piecewise linear functions on G which are closed under the tropical operations, minimum and additive constant. They are therefore the tropical analogues of linear series on algebraic curves, which are finite dimensional vector spaces of global sections of line bundles on curves. Unlike in linear algebra, there are several distinct ways of measuring the "size" of a tropical linear series. For example, the notion of "tropical rank" involves tropical linear dependence relations. In this talk, we explain a recent result stating that the tropical rank of a (reasonably well-behaved) tropical linear series is, in fact, equal to its topological dimension as a polyhedral space. If time permits, we will connect the tropical rank of a tropical linear series to its pure dimensionality, and explore the question of characterizing functions in a tropical linear series using evaluation on finitely many points of the graph.

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[*]Intervenant