

Smoothing of limit linear series on metrized complexes of algebraic curves

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Abstract

The theory of limit linear series on curves of compact type (reducible curves whose dual graph is a tree) was introduced by Eisenbud and Harris in 1986 and this theory has several applications to algebraic curves. This theory has recently been generalized to objects called “metrized complexes of curves” by Amini and Baker. A metrized complex of curves is essentially a metric graph with algebraic curves plugged into the vertices of this metric graph. Eisenbud and Harris showed that any limit g_d^1 on a curve of compact type can be smoothed to a g_d^1 on a smooth curve. We study the question of smoothing a limit g_d^1 on a metrized complex. We construct non-smoothable examples of limit g_d^1 and provide an effective characterization of a smoothable limit g_d^1 on a metrized complex. This characterization involves a detailed study of a tropical linear system underlying the limit g_d^1 .

This is ongoing work with Luo Ye.