Title: **Spectrahedral relaxations of hyperbolicity cones**

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Abstract: Given a hyperbolic polynomial and a hyperbolicity direction, we define a spectrahedral outer approximation defined by a linear matrix inequality of very small size. We ask whether one can ``extend'' the given hyperbolic polynomial to another hyperbolic polynomial in many more additional variables so that our spectrahedral relaxation coincides on the space corresponding to the original variables with the hyperbolicity cone. A positive answer would solve the Generalized Lax Conjecture saying that every hyperbolicity cone is spectrahedral. We have however only very partial results. We use in many ways the characterization of hyperbolic polynomials in three variables by Helton and Vinnikov.