Analysis and Differential Geometry Seminar

Averaging one-point hyperbolic-type metrics

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Abstract: It is known that the $\tilde{j}$-metric, the half-Apollonian metric, and the scale-invariant Cassinian metric are not Gromov hyperbolic. These metrics are defined as a supremum of one-point metrics (i.e., metrics constructed using one boundary point), and the supremum is taken over all boundary points. The aim of this talk is to show that taking the average instead of the supremum yields a metric that is Gromov hyperbolic. Moreover, we show that the Gromov hyperbolicity constant of the resulting metric does not depend on the number of boundary points used in taking the average. We also provide an example to show that the average of Gromov hyperbolic metrics is not, in general, Gromov hyperbolic.

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