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Quantum metrics from the trace on full matrix algebras

Abstract

F. Latremoliere’s Gromov-Hausdorff propinquity serves as a noncommutative analogue to the Gromov-Hausdorff distance on compact metric spaces. On the class of quasi-Leibniz quantum compact metric spaces, distance zero in propinquity is provided by a *-isomorphism of C*-algebras that induces an isometry between the state spaces. Hence, it can be the case that a fixed C*-algebra can be equipped with two quantum metrics that are at positive distance in the Gromov-Hausdorff propinquity. Utilizing quantum metrics from the work of K. Aguilar and Latremoliere on quantum ultrametrics for AF algebras, we prove that for any fixed $n \times n$-matrix algebra with $n$ not prime, certain natural quantum metrics are separated by a positive distance in the sense of the Gromov-Hausdorff propinquity (joint work with Konrad Aguilar).