

Analysis/dynamical systems Seminar

Friday, March 20, 2015

1:00-1:50 pm in Hume 331

Generalized Mazur-Ulam theorems and isometries of matrix spaces

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In the introduction of this talk we present some classical results on the surjective linear isometries of full matrix algebras. Next we show a substantial generalization of the classical Mazur-Ulam theorem concerning surjective isometries of normed linear spaces. It says that the surjective isometries of quite general algebraic structures (so-called point reflection geometries) locally preserve the algebraic operation meaning that those geometric transformations necessarily have algebraic features. Using that result we determine the surjective isometries of certain matrix structures (positive definite cone, unitary group) with respect to several important typically non-Euclidean metrics, generalized distance measures or divergences.