Diameter preserving surjections in the geometry of matrices

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(Joint work with Wen-ling Huang (Hamburg))

We consider a class of graphs subject to certain restrictions, including the finiteness of diameters. Any surjective mapping $\varphi : \Gamma \to \Gamma'$ between graphs from this class is shown to be an isomorphism provided that the following holds: Any two points of Γ are at a distance equal to the diameter of Γ if, and only if, their images are at a distance equal to the diameter of Γ'.

This result is then applied to the graphs arising from the adjacency relations of spaces of rectangular matrices, spaces of Hermitian matrices, and Grassmann spaces (projective spaces of rectangular matrices).

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