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Title: Nonsurjective maps between rectangular matrices preserving disjointness, (zero) triple product or norms

Abstract: Let $M_{m,n}$ be the space of $m \times n$ real or complex rectangular matrices. Two matrices $A, B \in M_{m,n}$ are disjoint if $A^*B = 0_n$ and $AB^* = 0_m$. In this talk, a characterization is given for linear maps $\Phi : M_{m,n} \to M_{r,s}$ sending disjoint matrix pairs to disjoint matrix pairs, i.e., $A, B \in M_{m,n}$ being disjoint ensures that $\Phi(A), \Phi(B) \in M_{r,s}$ being disjoint. The result is used to characterize nonsurjective linear maps that preserve JB^*-triple product, or just zero triple product, on rectangular matrices, defined by $\{A, B, C\} = \frac{1}{2}(AB^*C + CB^*A)$. The result is also applied to characterize linear maps between rectangular matrix spaces of different sizes preserving the Schatten p-norms or the Ky Fan k-norms.

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