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Igor Klep* (igor.klep@fmf.uni-lj.si). *Noncommutative partial convexity.*

Motivated by classical notions of partial convexity, and bilinear matrix inequalities, we present the theory of Γ -convexity in the free noncommutative setting. Given a tuple of polynomials Γ , a free set is called Γ -convex if it is closed under isometric conjugation by isometries intertwining Γ . We establish an Effros-Winkler Hahn-Banach separation theorem for Γ -convex sets; they are delineated by linear pencils in the coordinates of Γ and the variables x . We shall also consider partial convexity for nc functions. For instance, we will explain that nc rational functions that are partially convex admit butterfly-type realizations that necessitate square roots.

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