

Projective free Banach algebras and the stabilization problem in control theory

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The stabilization problem in control theory is, roughly speaking, the following: given an unstable plant, find a controller, such that the overall transfer function of their feedback interconnection is stable. It is known that plants possessing a coprime factorization are stabilizable. This raises the natural question of whether also stabilizable plants admit a coprime factorization. It is also known that if the ring of stable transfer functions under consideration is projective free, then the answer to the question is yes. In this talk we will show that common classes of stable transfer functions are indeed projective free by first showing that all Banach algebras R with a contractible maximal ideal space are projective free.

The talk is based on joint work with Alexander Brudnyi.