Title

Linear combinations of projections in operator algebras

Abstract

I will discuss the following questions about W* and C*-algebras:

- For which algebras are all elements linear combinations of projections? And if not all, which are? How many projections do we need?
- If the elements are positive, can the coefficients be chosen to be positive? How many do we need?
- Which positive elements are infinite sums of projections? (Converging in the strict topology in a multiplier algebra or in the strong topology in a W*-algebra.)
- Which are finite sums of projections?

I will survey these questions for B(H), W*-algebras and factors in particular, simple purely infinite real rank zero C*-algebras and their multiplier algebras, and a class of stably finite C*-algebras and their multiplier algebras.