

Contractions of low dimensional complex associative algebras

ABSTRACT

Contraction is one of the most important concepts that play an important role from the mathematical and physical point of view. In this work, the contractions of complex associative algebras are considered. We focus on the variety $A_2(\mathbb{C})$ that consisting of all associative algebras of dimension two over the complex numbers \mathbb{C} (including nonunital). Various contractions criteria are collected and new criteria are proposed to test the possible existence of contraction for each pair of associative algebras. As a result, we prove that the variety $A_2(\mathbb{C})$ has three irreducible components, two of dimension 2 and one of dimension 4.

Keyword: Contraction; Associative algebras