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# MULTI-CRITERIA DECISION MAKING USING COMPLEX CUBIC PYTHAGOREAN FUZZY SET

**V. Chinnadurai, S. Thayalan and A. V. Raghavendra Rao***

Department of Mathematics,
Annamalai University, Chidambaram - 608002, Tamil Nadu, INDIA

E-mail : chinnaduraiau@gmail.com

*B V Raju Institute of Technology, Medak - 502313, Telangana, INDIA

E-mail : raghavendrarao.av@bvrit.ac.in

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**Abstract:** In this article, we introduce the notion of a complex cubic Pythagorean fuzzy set (CCPyFS). We discuss some of its properties. Also, we present the algebraic and aggregation operators on CCPyFS. Finally, we analyze two case studies using aggregation operation to select the best cotton variety from vendors.

**Keywords and Phrases:** Complex Pythagorean fuzzy set, complex interval-valued Pythagorean fuzzy set, complex cubic Pythagorean fuzzy set.

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## 1. Introduction

Zadeh [13] introduced the concept of a fuzzy set (FS). Also, he discussed the concept of interval-valued FS (IVFS) [14]. The concept of intuitionistic FS (IFS), a generalization of FS was introduced by Attanassov [2]. Later, Atanassov and Gargov [3] presented the notion of interval-valued intuitionistic FS (IVIFS) to deal with uncertainty in a broader perspective than FS. Yager [12] introduced the concept of Pythagorean FS with a condition that the square sum of its membership