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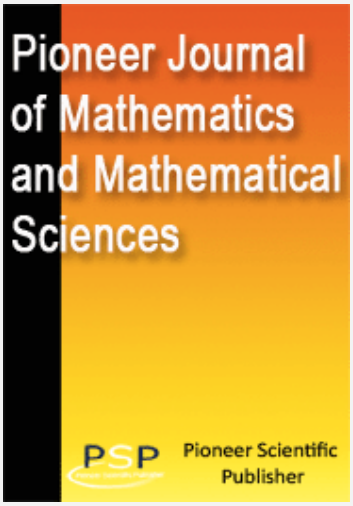

A NEW EXTENSION OF GEGENBAUER MATRIX POLYNOMIALS AND THEIR PROPERTIES

A. Shehata

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Abstract

The aim of this paper is to define and study the Gegenbauer matrix polynomials of two variables. An explicit representation, three-term matrix recurrence relations, differential recurrence relations and hypergeometric matrix representation for the Gegenbauer matrix polynomials of two variables are given. The Gegenbauer matrix polynomials are solutions of the matrix differential equations and expansion of the Gegenbauer matrix polynomials as series of Hermite and Laguerre matrix polynomials of two variables are established.

Keywords and phrases: hypergeometric matrix function, Hermite, Laguerre and Gegenbauer matrix polynomials, matrix recurrence relations, matrix differential equations.