

ALGEBRAIC COMPUTATION OF SPIN COEFFICIENTS IN NEWMAN-PENROSE FORMALISM USING MATHEMATICA

A.H. HASMANI, P.I. ANDHARIA*

DEPARTMENT OF MATHEMATICS
SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR , INDIA
E-MAIL: AHHASMANI@GMAIL.COM

*DEPARTMENT OF MATHEMATICS
BHAVNAGAR UNIVESITY
BHAVNAGAR, INDIA

E-MAIL: PARESHANDHARIA@YAHOO.COM

ABSTRACT. Newman-Penrose (NP)formalism [5, 13], in general relativity is a tetrad formalism in which various geometrical quantities are projected on a chosen null tetrad basis. Spin coefficients in NP formalism replace connection coefficients in geometry. Applications of spin coefficients are discussed by many authors, in diverse fields of general relativity and cosmology, like Ahsan [1], Ahsan et al [2], Hasmani and Ahsan [8], Hasmani and Katkar [10] and others. The computations involved are very lengthy and complicated. Motivated by such a large number of applications and looking to the complexity involved, we have exploited some features of computer algebra system Mathematica to carry out algebraic computation of spin coefficients in Newman-Penrose formalism for given metric and null tetrad. In this paper the required Mathematica program is also included.

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