

Quaternion Analyticity, Twistor Structures and Conservative Multi-Particle Dynamics

Vladimir Kassandrov

Institute of Gravitation and Cosmology, Peoples' Friendship University of Russia
Ordzhonikidze Str. 3, Moscow
Russia
vkassan@rambler.ru

General solution to the equations of (bi)quaternionic analyticity (generalized CR-equations) defines a shear-free null congruence of rays in (complexified) Minkowski space and, according to the Kerr–Penrose theorem, represents in the terms of equations for twistor functions. Caustics of the congruence may be naturally identified with particle-like formations (of two kinds). We prove that for any polynomial twistor function corresponding multi-particle dynamics obeys a full set of conservation laws and, moreover, the total energy is always integer being equal to the highest degree of generating polynomials.