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Quaternion algebra on 4d superfluid quantum space-time**Valeriy I. Sbitnev***Petersburg Nuclear Physics Institute, Russia*

Four quaternion matrices of rank 4 $\eta_0, \eta_x, \eta_y, \eta_z$ compose a basis of our 4D space-time. First, we write in this basis the energy-momentum density tensor loaded also by the 4D vector EM potential. Second, we define the generating differential operator $D = ic-1\partial_t\eta_0 + \partial_x\eta_x + \partial_y\eta_y + \partial_z\eta_z$, where $\partial_t = \partial/\partial t, \dots$ are partial differential operators, c is the speed of light, and i is the imaginary unit. The first step is the application of the differential generating operator D to the energy-momentum density tensor to generate the force density tensor, see Fig. 1. This figure shows all steps of applying the differential generating operator D leading to the appearance of gravitomagnetic equations representing the gravito-torsion and the Maxwell EM equations.

Biography

Valeriy Sbitnev has PhD in 1987 from Moscow State University. He is senior researcher in Saint-Petersburg Nuclear Physics Institute, Kurchatov NRC. He has published more than 70 papers in reputed journals shown in ORCID 0000-0001-6006-0214.