On the Theory for a Spin 2 Particle with Anomalous Magnetic Moment in the Basis of Tensors of 2-nd and 3-rd Ranks

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Abstract: The known Pauli – Fierz theory for spin 2 field is based on the use of second order equations. Equivalent approach based on the first order equations was developed by Fedorov and Regge, this theory assumes the use of 30-component field function. Later it was proposed more complicated 50-component theory which describes the massive spin 2 particle possessing the anomalous magnetic moment. In both theories, there is known transition to massless case. Initially in 50-component theory it was used the following set of tensors: scalar, two vectors, symmetric second rank tensor, symmetric tensor of the third rank, and 3-rank tensor antisymmetric in two indices. In the present paper we transform the initial system of equations to new variables: symmetric 2-rank tensor and 3-rank tensor which is symmetric in two indices. The symmetry properties of the new variables are similar to symmetry properties of the metric tensor and Kristoffel symbols in General Relativity. The matrix 50-component theory in Minkowski space-time is

elaborated. It is demonstrated that in presence of external electromagnetic fields, after eliminating the 3rd rank tensor we arrive at the system of equations for symmetric tensor which contains the non-minimal interaction term trough electromagnetic tensor due to anomalous magnetic moment of the spin 2 particle. In accordance with the tetrad method by Tetrode – Weyl – Fock – Ivanenko, extension to any curved space-time is performed.

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