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Particle content of gravity theories with Lagrangians explicitly depending on the Weyl tensor

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We present a modified method of investigation of particle content of a metric theory of gravitation whose Lagrangian explicitly depends on the Weyl tensor. Without any resort to observations we consider the problem from purely field-theoretical viewpoint. We apply the tenet of field theory that each classical field should correspond to a quantum particle with definite mass and spin and deterministic dynamics. These features may be established only for free fields (decoupled from spacetime curvature) and this is achieved by putting all coupling constants in the gravitational Lagrangian equal to zero. This method shows the Lagrangian should be free of the Weyl tensor since it generates a field in a gravitational multiplet which is dynamically undetermined and in consequence has no definite mass and spin.

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