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Classical and Quantum features of the spin-curvature coupling FRANCESCO CIANFRANI, GIOVANNI MONTANI, ICRANet and Dipartimento di Fisica - Università di Roma "La Sapienza" — We analyze the behavior of a spinning particle in gravity, both from a quantum and a classical perspective point of view. We infer that, since the interaction between the space-time curvature and a spinning test particle is expected, then the main features of such an interaction can get light on which degrees of freedom have physical meaning in a quantum gravity theory with fermions. Finally, the dimensional reduction of Papapetrou equations is performed in a 5-dimensional Kaluza-Klein background and Dixon-Souriau results for the motion of a charged spinning body are obtained.

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