

Separability in Kerr–NUT–(A)dS spacetime

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Abstract

Kerr solution belongs into a class of geometries with a rich structure of explicit and hidden symmetries. They are generated by the so-called principal tensor which allows to build a tower of Killing vectors and Killing tensors. Thanks to these objects, it turns out that basic field equations are separable. We review the older results for the scalar and Dirac fields and present a recent development for the electromagnetic and Proca fields. In four dimensions this approach is an alternative of a well-known Teukolsky method for the electromagnetic field; however it can be generalized to higher dimensions, to the case of a massive vector field, and to the whole class of off-shell metrics possessing the principal tensor.