

“Hidden” symmetries and Killing-Yano tensors

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ABSTRACT

We investigate the relation between “hidden” symmetries, Stäckel-Killing tensors and Killing-Yano tensors. A necessary condition that a Stäckel-Killing tensor of valence 2 be the contracted product of a Killing-Yano tensor of valence 2 with itself is re-derived for a Riemannian manifold. This condition is applied to the generalized Euclidean Taub-NUT metrics which admit a Kepler type symmetry. It is shown that in general the Stäckel-Killing tensors involved in the Runge-Lenz vector cannot be expressed as a product of Killing-Yano tensors. The only exception is the original Taub-NUT metric.

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