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Conserved charges from distorted conformal Killing vectors in pp-waves

It has been shown that massive geodesics may admit certain nonlocal integrals of motion associated with conformal Killing vectors. In the exceptional case of pp-wave space-times these charges reduce to local expressions generated by a mass dependent distortion of the conformal Killing algebra. We demonstrate under which modification of the Noether symmetry procedure these vectors can be obtained as point symmetries and we discuss their relation to higher order symmetry vectors giving integrals of motion which are rational functions in the momenta.

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