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Debate on quadrupole formula in de Sitter

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It is well-known that gravitational fields from an isolated system depend on the time varying quadrupole moment of the source. Quadrupole formula provides an estimate of the energy loss due to gravitational radiation. The first proposed quadrupole formula for gravitational waves in de Sitter was derived by Ashtekar, Bonga, Kesavan (ABK). We point out that a consistent quadrupolar truncation is needed to upgrade the ABK formula. We also compare our result to a recently obtained result of Bonga, Bunster, Perez. We write the quadrupole formula in two distinct ways which allow standard flat limit and negative definite energy flux in de Sitter. The existence of several proposals for the quadrupole formula suggests that fundamental requirements on the uniqueness of the quadrupole formula, such as the enforcement of gauge invariance, are still missing.

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