

No consistent cross-interactions for a collection of massless spin-2 fields

Nicolas Boulanger¹, Thibault Damour²,
Leonardo Gualtieri¹ and Marc Henneaux^{1,3}

¹*Physique Théorique et Mathématique, Université Libre de Bruxelles,
Campus Plaine C. P. 231, B-1050 Bruxelles, Belgium*

²*Institut des Hautes Etudes Scientifiques,
35, route de Chartres, F-91440 Bures-sur-Yvette, France*

³*Centro de Estudios Científicos, Casila 1469, Valdivia, Chile*

ABSTRACT

We report a no-go theorem excluding consistent cross-couplings for a collection of massless, spin-2 fields described, in the free limit, by the sum of Pauli-Fierz actions (one for each field). We show that, in spacetime dimensions >2 , there is no consistent coupling, with at most two derivatives of the fields, that can mix the various “gravitons”. The only possible deformations are given by the sum of individual Einstein-Hilbert actions (one for each field) with cosmological terms. Our approach is based on the BRST-based deformation point of view*.

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