

Service de Physique de l'Univers, Champs et Gravitation

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Sujet de mémoire

Higher dualisations of gravity and higher spin fields

In a spacetime of dimension n , the *dual graviton* is characterised by a Young diagram with two columns, the first of length $n - 3$ and the second of length one [1]. In the work [2], the off-shell dualisation relating the dual graviton to the double-dual graviton was worked out. It displays the precise off-shell field content and gauge invariances of the dual theory. It was then showed that one can further perform infinitely many off-shell dualities, reformulating linearised gravity in an infinite number of equivalent actions. The actions require supplementary mixed-symmetry fields which are contained within the generalised Kac-Moody algebra \mathfrak{e}_{11} that is believed (see [3] for a review) to contain the hidden symmetry of gravity. During the master thesis, we will further explore the action for the double-dual graviton and investigate the higher dualisations, in order to make contact with higher-spin gauge fields.

Prerequisites: “Théorie des groupes” S-PHYS-201, “Relativité générale” S-PHYS-053 and “Théorie quantique des champs I” S-PHYS-049

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References

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- [2] N. Boulanger, P. P. Cook and D. Ponomarev, “Off-Shell Hodge Dualities in Linearised Gravity and E11,” JHEP **09** (2012), 089 doi:10.1007/JHEP09(2012)089 [arXiv:1205.2277 [hep-th]].
- [3] P. West, “A brief review of E theory,” Int. J. Mod. Phys. A **31** (2016) no.26, 1630043 doi:10.1142/S0217751X1630043X [arXiv:1609.06863 [hep-th]].