

Service de Physique de l'Univers, Champs et Gravitation

Année académique 2019/2020

Sujet de mémoire

Twisted duality for massive gravitons in AdS

On a Minkowski background of dimension D , the physical degrees of freedom of linearised gravity can be described using either a symmetric rank-2 tensor, that is the metric, or a tensor with $D - 2$ indices and a specific symmetry. These two options are called *dual* descriptions of the graviton. In the presence of a cosmological constant a similar duality was known, but it involves a tensor with $D - 1$ indices besides the graviton. The apparent clash between these two results have been clarified in [1] by reformulating the duality on (anti) de Sitter backgrounds with an extra auxiliary field with $D - 2$ indices. In the limit of vanishing cosmological constant, the auxiliary field carries the degrees of freedom of the graviton, thus recovering the known duality in Minkowski space. The duality has been extended to massive and “partially-massless” spin-2 particles (aka gravitons) [1] and then re-derived from an analysis of the equations of motions for massless and partially massless particles [2]. The goal of the master project is to analyse the effect of duality transformations on the equations of motion also on massive spin-2 particles and then to extend all results to particles of spin 3.

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References

- [1] N. Boulanger, A. Campoleoni and I. Cortese, “Dual actions for massless, partially-massless and massive gravitons in (A)dS,” *Phys. Lett. B* **782** (2018) 285 [[arXiv:1804.05588](https://arxiv.org/abs/1804.05588) [hep-th]].
- [2] N. Boulanger, A. Campoleoni, I. Cortese and L. Traina, “Spin-2 twisted duality in (A)dS,” *Front. in Phys.* **6** (2018) 129 [[arXiv:1807.04524](https://arxiv.org/abs/1807.04524) [hep-th]].