

Gauged supergravity: formalism and applications

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Abstract

The embedding tensor formulation of (half-)maximal gauged supergravities in various dimensions plays a crucial role in understanding string dualities within the context of string compactifications. We will start by first giving an overview of the aforementioned formalism in 4D. Later, we will continue by discussing the embedding tensor/fluxes and Domain Wall/brane dictionaries for compactifications of type II string and M-theory. Among its many applications, gauged Supergravity provides a framework for the construction of black holes in Anti de Sitter (AdS) spacetime. These will be the focus of the second part of the seminar. We will review Supersymmetric solutions in 4 and 5 dimensions, with particular emphasis on the 1/4 BPS black holes in 4D that have triggered new investigations in recent years. We will illustrate the relations between the ungauged and gauged Supergravity solutions that emerged from the latest studies. Finally, the M-theory origin of AdS black holes and their role for holography will be discussed.

References

Find here a brief list of the relevant references:

- The embedding tensor formalism in N=4 & N=8 (Schön and Weidner hep-th/0602024, De Wit, Trigiante, Samtleben arXiv:0705.2101),
- Applications to flux compactifications (Samtleben's lecture notes arXiv:0808.4076, Dibitetto, Guarino, Roest arXiv:1102.0239, 1402.4478),
- Some comments on Domain Walls and their string/M-theory lifts (based on hep-th/0103233, hep-th/0203202, hep-th/0404100).
- Black holes in AdS from Supergravity and 1/4 BPS flow (Cvetič et al. hep-th/9903214, Liu et al. hep-th/0408205, Cacciatori-Klemm arXiv:0911.4926, AG-Dall'Agata arXiv:1012.3756, Hristov et al. arXiv:1110.2688).
- Solutions with Hypermultiplets and uplift to M-theory (Halmagyi et al. arXiv:1305.0730, Klemm et al. arXiv:1503.09055, Benini and Zaffaroni arXiv:1504.03698, Katmadas and Tomasiello arXiv:1509.00474).
- Outlook - Rholography (Gaddam et al. arXiv:1412.7325) and Black holes in the new gauged N=8 Supergravity (Anabalon and Astefanesei arXiv:1311.7459, Pope et al. arXiv:1506.04270).