

Axialgravisolitons at infinite corner

Gravitational solitons (gravisolitons) are particular exact solutions of Einstein field equation in vacuum build on a given background solution. Their interpretation is not yet fully clear but they contain many of the physically relevant solutions low N -solitons solutions. However, a systematic study and characterization of gravisolitons solution for every N is lacking and their relevance in a theory of quantum gravity is not fully understood. This work aims to investigate and characterize some properties of N -axialsoliton solutions such as their asymptotically behaviour and asymptotic symmetries given minimal assumptions on the background metric. We develop an explicit systematic asymptotically expansion for the N -axialsoliton solution and we compute the leading order of the asymptotic killing vectors. Moreover, in the perspective to better understand the role of gravisolitons in quantum gravity we make a link, and a one of the first explicit test, to the corner symmetry proposal deriving which subalgebra of the universal corner symmetry algebra is generated by the asymptotic Killing vectors of N -axialsoliton solution. In the spirit of the corner proposal, the axialgravisoliton corner symmetry algebra (agc_{∞}) can be useful for the quantization of the non-asymptotically flat sector of gravity while, in the spirit of IR triangle, new soft theorems and memory effects could emerge. Based on Class.Quant.Grav. 41 (2024) 17, 177001.

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