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## Renormalizability and UV behavior of 5D gauge theories

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The idea of supplementing the number of spacetime dimensions has long been deemed as one of the potential extension of the Standard Model, as it provides powerful tools to explain some of its shortcomings. One example of higher-dimensional formulations are asymptotic grand unified theories (aGUTs), for which the couplings do not meet at a high scale, but instead flow together towards a fixed point in the UV. Although the higher-dimensional dynamics push the theories into a nonpertubatively renormalizable regime, they can be thought of as fundamental in the context of the asymptotic safety scenario. Using these techniques, we focus on five-dimensional gauge theories and check the existence of fixed points, thus ensuring a good behavior in the UV. Additionally, the presence of both bulk and localized divergencies is investigated, with the purpose of shedding light on the renormalization status of such theories.

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