

UV renormalization, locality and global hyperbolicity

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We calculate one-loop corrections to four-point functions in the scalar ϕ^4 field theory in the spaces with constant curvature and in flat space in the presence of a perfect mirror. We explain why the calculations in Euclidian and Minkowskian signatures should not provide the same result even at the leading order in non globally hyperbolic situations. Moreover, we either encounter non-local counter-terms or a doubling of the beta-function. Our arguments are quite general and applicable to other non-conformal theories in the same spaces.