SEMPARIS – Séminaires en région parisienne

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Cours

Mardi 3 Décembre 2019, 11 :30
LPTENS, LPT Library
Domaines : hep-th

Titre : *The epsilon expansion meets semiclassics*

Orateur : **Gabriel Francisco Cuomo**

Résumé : *In this talk I will study the scaling dimension of the lightest operator of charge n in the $U(1)$ model at the Wilson-Fisher fixed point in $4-\varepsilon$ dimensions. Even for a perturbatively small fixed point coupling λ, standard perturbation theory breaks down for sufficiently large λn. Treating λn as fixed for small λ, I will show that the scaling dimension can be successfully computed through a semiclassical expansion around a non-trivial trajectory, resulting in a series in the coupling whose coefficients are fixed functions of λn. I will discuss explicitly the computation of the first two orders in the expansion. The result, when expanded at small λn, perfectly agrees with all available diagrammatic computations. The asymptotic at large λn reproduces the systematic large charge expansion, recently derived in CFT. Similar results can be derived in the $U(1)$ model in $3-\varepsilon$ dimensions. I will briefly comment on the application of similar ideas in the calculation of other observables, such as three-point functions of charged operators.*