Covariantly Quantum Field Theory

Vincenzo Vitagliano

CENTRA - Instituto Superior Tecnico, University of Lisbon, Portugal
vincenzo.vitagliano@ist.utl.pt

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ABSTRACT

The usual calculation of effective actions relies on some assumption about the split between background and fluctuating field variables, in principle leading to a further dependence of the results on the choice of background and gauge. Arguing that such dependence of the effective action is a by-product of the quantum fields' dependence on the parametrization, Vilkovisky and De-Witt developed a geometrical, field-space covariant procedure to modify the usual background-field method which renders the effective action gauge- and background-independent. In this talk, I will present some modern cosmological applications of the Vilkovisky-DeWitt method, and further suggestions about the role of quantum corrections in astrophysical systems.