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Fermionic fuzzy geometries

A random fuzzy geometry consists of a fuzzy geometry, i.e. a spectral triple $(M_N(\mathbb{C}), V \otimes M_N(\mathbb{C}), D)$ where the Dirac operator is a random variable with some predetermined distribution of the form $\frac{1}{Z} e^{-S(D)} dD$, traditionally these actions $S(D)$ consist of traces of powers of D. In this talk I will discuss some of the difficulties associated to adding a fermionic term to this action as well as some new results on the effect of such a fermionic term for a fuzzy geometry of signature $(0, 1)$.

This is joint work with Nathan Pagliaroli and Masoud Khalkhali.