Fuzzy CP^2 or S^2 — which is the true vacuum?

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The matrix model on the homogeneous space:

$$S = N\mathrm{tr}\left(-\frac{1}{4}\sum_{\mu,\nu=1}^{8}[A_\mu, A_\nu]^2 + \frac{2i\alpha}{3}\sum_{\mu,\nu,\rho=1}^{8} f_{\mu\nu\rho}A_\mu A_\nu A_\rho\right).$$

Its classical equation of motion incorporates the four-dimensional fuzzy CP^2 classical solution, as well as the fuzzy S^2 sphere.

$$A_\mu^{(CP^2)} = \alpha T_\mu^{(m,0)}. \text{ where}$$

$$T_\mu^{(m,0)} = \underbrace{(t_\mu \otimes 1_3 \otimes \cdots \otimes 1_3)_{\mathrm{sym}}}_{m\text{-fold}} + (1_3 \otimes t_\mu \otimes \cdots \otimes 1_3)_{\mathrm{sym}} + \cdots + (1_3 \otimes \cdots \otimes 1_3 \otimes t_\mu)_{\mathrm{sym}}.$$

We investigate the stability of these two classical solutions via the Monte-Carlo simulation.