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**Title:** Rigorous nonperturbative results related to  $p$ -adic AdS/CFT

**Abstract:** There has been recent interest in the  $p$ -adic analogue of the  $O(N)$  model, in particular by the late Steven Gubser and his collaborators, within the context of the  $p$ -adic AdS/CFT correspondence. These models are believed to be conformally invariant (in the  $p$ -adic sense) and thus to provide examples where one could investigate such a correspondence. I will review some rigorous nonperturbative results on such models in the particular case  $N = 1$ , i.e., that of a self-similar (and thus massless) scalar  $\phi^4$  QFT. I will first review the construction obtained by Ajay Chandra, Gianluca Guadagni and myself in 2013, where the model is realized as a probability measure on the Schwartz-Bruhat space of distributions on three-dimensional  $p$ -adic space. This measure is obtained as a weak limit of essentially finite dimensional measures given by putting ultraviolet and infrared cutoffs on the  $\phi^4$  functional integral. In fact, this is done for the joint probability measure of the field  $\phi$  together with a suitably (additively and multiplicatively) renormalized square field  $\phi^2$ . I will then also review a result I obtained in 2015 where mixed pointwise correlations of  $\phi$  and  $\phi^2$  of arbitrary order are constructed and shown to satisfy precise bounds which quantify the singularity of these correlations as points collide. While a proof of conformal invariance is still missing, invariance under isometries and scaling has been established.