Abstract Submitted
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**Nonperturbative Complete Energy Eigenbasis for Strongly Coupled Systems**[1] ANTHONY HEGG, PHILIP PHILLIPS, University of Illinois at Urbana-Champaign — We develop a non-pertrubative approach to the strongly coupled $\phi^4$ theory by using an eigen-energy basis that solves the full equations of motion. By rewriting the action in terms of this basis we are able to implement a nonperturbative "energy-shell" renormalization procedure, which yields a critical exponent of $\nu = 0.6308$. We then identify and characterize an additional fixed point at even stronger coupling. All flows are relevant at this additional fixed point and the correlation exponent $\nu = \frac{2}{3}$ in three dimensions. We then discuss the differences between the value obtained for the anomalous dimension $\eta = 0.10$ and that found in the literature $\eta = 0.03$. Finally we report precise mean field exponents and logarithmic corrections in four dimensions.

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