Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)
Vol. XX (2020), 1359-1427

# The invariant measure and the flow associated to the $\Phi^4_3$-quantum field model

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**Abstract.** We give a direct construction of invariant measures and global flows for the stochastic quantization equation to the quantum field theoretical $\Phi^4_3$-model on the 3-dimensional torus. This stochastic equation belongs to a class of singular stochastic partial differential equations (SPDEs) presently intensively studied, especially after Hairer's groundbreaking work on regularity structures. Our direct construction exhibits invariant measures and flows as limits of the (unique) invariant measures for corresponding finite-dimensional approximation equations. Our work is done in the setting of distributional Besov spaces, adapting semigroup techniques for solving nonlinear dissipative parabolic equations on such spaces and using methods that originated from work by Gubinelli et al on paracontrolled distributions for singular SPDEs.

**Mathematics Subject Classification (2010):** 81S20 (primary); 81T08, 60H15, 35Q40, 35R60, 35K58 (secondary).