Stochastic continuum theory of active nematics SHRADHA MISHRA, Syracuse University, FRANCESCO GINELLI, HUGUES CHATE, CEA Service de Physique de l’ Etat Condensé, CEN Saclay, 91191 Gif-sur-Yvette, France, SANJAY PURI, School of Physical Sciences, Jawaharlal Nehru University, New Delhi, 110067, India, SRIRAM RAMASWAMY, Centre for Condensed Matter Theory, Department of Physics, Indian Institute of Science, Bangalore, India — We derive a stochastic continuum theory of active nematics by direct coarse-graining of a generic microscopic model and study it numerically. This allows to clarify the microscopic origin of the various terms found and to determine the non-trivial structure of the noises. We show in particular that two terms coupling density and order the non-equilibrium active current argued before to be at the origin of giant density fluctuations, and a multiplicative conserved noise are necessary to obtain a faithful description of the original model.

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