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A Line Defect Structure in Soft-Mode Turbulence[1] RINTO A NUR QOMARU ZAMAN, TATSUHIRO UEKI, YOSHIKI HIDAKA, Kyushu University, MICHAEL I. TRIBELSKY, MIREA Russia, SHOICHI KAI, Kyushu University — Defects have been much investigated in various physical systems. The property and symmetry in a system can be reflected by the existence of defects. For example in spin models, symmetries in the 2D XY and 2D Ising models generate point and line defects, respectively. In the soft-mode turbulence (SMT) in electroconvection of homeotropic nematic systems which is a kind of spatiotemporal chaos induced by nonlinear interaction between the Nambu-Goldstone modes and the convective modes, a curious line structure called *blackline* has been discovered. We measured the density of the blackline as a function of control parameters, ac voltage and frequency. By detailed observations and analysis, it is clarified that the blackline is a structure of the nematic director in the x-y plane and includes a sequence of point defects. We discussed similarity with the density of the blackline and that of the point defect in the conventional 2D XY model. The occurrence of this type of defects is only due to the symmetry in the SMT and independent of the properties of fluctuations.

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