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Noise-driven plasma flow in Hasegawa-Mima equation CHANG-BAE KIM, Soongsil Univ — The generation of intrinsic flows amid turbulence in hot plasmas is of great importance in the nuclear fusion experiments. Instead of working out plasma dynamics of all scales we concentrate on the evolution of large-scale fluctuations. Influence of the microscopic turbulence on the macroscopic dynamics is modeled as a noise. For pedagogical purposes, spontaneous appearance of the flow is studied with driven Hasegawa-Mima equation (HME) by external noise. If the noise has a parity-nonconserving (PNC) property, it is shown that an advective term associated with a uniform flow is inherently generated in the HME. Thus, the plasma transport appears in the form of both convective (non-diffusive) and enhanced diffusive flux. Numerical simulation of the noise driven HME of coarse scale is performed to confirm the result of the analytical theory and to verify the robustness of the noise-driven flow. The result will be discussed at the presentation.

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