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Feedback of large-scale fluctuations on driving noise CHANG-BAE KIM, Soongsil University — The so-called predator-prey model that describes the dynamics of large-scale fluctuations and short-scale turbulence is studied by substituting the turbulence with noise. It is known that large-scale fluctuations in the plasma driven by the parity-nonconserving (PNC) noise become unstable if the relative level of the PNC noise is over a threshold $\alpha_{\rm C} = logR/R$, where R is the ratio of the largest to the smallest scales. The PNC noise may model such short-scale turbulence as the drift waves of short wave lengths. As a result, large-scale fluctuations emerge and grow in time. If this is an action of the turbulence on large scales, the reaction of the large-scale fluctuations on the turbulence is to lower the effective strength of the PNC noise below the threshold in order to make the plasma reach stationary state. This feedback is worked out by renormalizing the noise up to the lowest nontrivial order. It will be shown that the isotropic part of the noise is enhanced while the PNC piece being unchanged and that, as a result, the relative strength of the PNC to the isotropic noise is smaller than $\alpha_{\rm C}$.

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