Large eddy simulations analysis of coupling force effect on the evolution of energy spectrum in superfluid

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The reliability of the filtered HVBK model is now investigated via some large-eddy simulations of freely decaying isotropic superfluid turbulence .The filtered HVBK model is solved using a fully pseudo-spectral method,which is an extension of the classical Rogallo's method to the two-fluid model. In this paper, we analyze the evolution of various terms in the momentum equations of model HVBK via the equilibrum equation of the function of energy spectrum . The evolution of the different terms is presented in both cases with and without coupling force. Results show that this coupling force decreases energy dissipation in normal part of HVBK model and energy transfer is more significant when this force is taken in account.