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Momentum Theorems for Vlasov and Gyrokinetic Turbulence<sup>1</sup> L.T. NEKO, P.H. DIAMOND, C. MCDEVITT, Y. KOSUGA, University of California, San Diego, X. GARBET, CEA Cadarache, O.D. GURCAN, Laboratoire de Physique et Technologie des Plasmas, T.S. HAHM, Princeton Plasma Physics Laboratory, Princeton University — In this work, we extend Charney-Drazin type momentum theorems to encompass Vlasov and gyrokinetic systems. The common key element of these and their fluid antecedents is the existence of a Kelvin's Theorem for a conserved circulation in the relevant phase space. A pseudomomentum, quadratic in the perturbed distribution function, is identified. In the non-resonant limit, we show that this pseudomomentum reduces to the familiar wave momentum density. Constraint relations for anomalous resistivity (1D) and GK zonal flow growth are derived. The relation to phase space density granulations is discussed.

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