

Abstract Submitted
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Exact momentum conservation laws for the gyrokinetic Vlasov-Poisson equations ALAIN BRIZARD, Saint Michael College, NATALIA TRONKO, CFSA University of Warwick — The exact momentum conservation laws for the nonlinear gyrokinetic Vlasov-Poisson equations are derived by applying the Noether method on the gyrokinetic variational principle [A. J. Brizard, *Phys. Plasmas* **7**, 4816 (2000)]. From the gyrokinetic Noether canonical-momentum equation derived by the Noether method, the gyrokinetic parallel momentum equation and other gyrokinetic Vlasov-moment equations are obtained. In addition, an exact gyrokinetic toroidal angular-momentum conservation law is derived in axisymmetric tokamak geometry, where the transport of parallel-toroidal momentum is related to the radial gyrocenter polarization, which includes contributions from the guiding-center and gyrocenter transformations.

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