A history of semi-Lagrangian methods in plasma physics.

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Abstract: After the original Cheng and Knorr paper on a grid based method for solving the Vlasov-Poisson equation, we generalized the method for more general Vlasov type equations including Vlasov-Maxwell and gyrokinetic equations. Since then many physics codes have been developed based on this method, including the gyrokinetic code GYSELA used for magnetic fusion simulations. Also on the mathematical side many papers have been published to improve the method in several ways. The talk will present an overview of the method and the main developments that have followed since our 1999 paper