Reduced Vlasov-Poisson Model and its Instabilities

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Enormous computational difficulties arising in modeling plasma dynamics by solving Vlasov equation directly in 3 spatial dimensions (and 3 velocity dimensions) motivate the search of more practical models of plasma dynamics. Here we consider Vlasov Multi-Dimensional model which is reduction of Vlasov model, that is specifically designed to take advantage of solution properties in regimes when plasma waves are confined to a narrow cone. To understand what additional constrictions this model imposes on the system we study its instabilities.