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An alternative approach for the study of the linear Vlasov stability ENRICO CAMPOREALE, Queen Mary University, London, UK, GIAN LUCA DELZANNO, GIOVANNI LAPENTA, LANL, WILLIAM DAUGHTON, University of Iowa — We present a technique for solving the linearized Vlasov-Maxwell set of equations, in which the perturbed distribution function is described as an infinite series of orthogonal functions, chosen as Hermite-Grad polynomials. The orthogonality properties of such functions allow us to decompose the Vlasov equation into a set of infinite coupled equations. This technique is based on solid but easy concepts, not attempting to evaluate the integration over the unperturbed trajectories and can be applied on any equilibrium. Although the solutions are approximate, because they neglect contributions of higher order coefficients of the series, the physical meaning of the low-order coefficients is clear. This allows us to know exactly on which assumptions the approximation is made and gives a snapshot on which quantites are dominant in the equilibrium. Furthermore the accuracy of solution, which depends on the number of terms taken in account in the Hermite series, appears to be merely a problem of computational power. The method has been tested setting an initial 1-D Harris equilibrium that is known to give rise to several instabilties, like tearing, drift-kink, lower hybrid. To comapre, the same problem has also been studied using particle-in-cell simulations.

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