

CROSSOVER BEHAVIOR BETWEEN KdV AND mKdV EQUATIONS  
IN A COLD PLASMA WITH NEGATIVE IONS

*Dan Grecu, Anca Visinescu*  
*Department of Theoretical Physics*  
*National Institute of Physics and Nuclear Engineering, Bucharest, Romania*

Abstract

It is well known that the KdV equation describes the behavior of ion-acoustic waves in a cold plasma. In the presence of negative ions, if their concentration satisfies a certain condition (critical concentration) the relevant equation is the modified KdV equation. The transition between these two regimes is studied from several point of view. The multiple scales analysis is extended to higher order and the role played by the next equations in the corresponding hierarchies KdV and mKdV is discussed.