

Mhaskar-Saff functional and variational principle for some hyperbolic PDE's

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The extremal problems of electrostatics with presence of the external field play an important role in an approach to some regularization of hyperbolic equations (the dispersion regularization of the inviscid Burger's equation, the continuum limit of the Toda lattice). The approach originated and have been developed by P. Deift and K. McLaughlin in their monograph "Continuum limit of the Toda lattice". We shall discuss the role of the famous Mhaskar-Saff functional in the construction of a generalized solution for non-regularized PDE's. An important observation is that the M-S variational principle selects a unique solution beyond the critical point which, in addition, satisfies the classical Hugoniot condition on the shock.