LAGRANGIAN SOLUTIONS TO SYSTEMS OF REAL PRINCIPAL TYPE

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In 1982 Nils Dencker defined systems of pseudodifferential operators of real-principal type and studied their propagation of singularities. Several important equations from physics classify as such systems of real-principal type, for example the Maxwell-equations of electrodynamics and the Lamé-equations of isotropic elastodynamics.

In this thesis, we investigate Lagrangian distributions that solve the homogeneous equation for systems of real-principal type, modulo smooth distributions. In particular, we derive a transport equation for these systems, which comprises a quantitative description of the propagation of the amplitude, of solutions, along rays, the bicharacteristic curves. We shall show the necessity and the sufficiency of the transport equation, for Lagrangian solutions.