Joly, J. L.; **Métivier, G.**; **Rauch, J.**

Trilinear compensated compactness and nonlinear geometric optics. (English) Zbl 0840.35013

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The paper studies the behavior of bounded families of solutions of nonlinear systems of partial differential equations. The problem deals with equations which determine the weak limits of soutions u^ε through Young measures, i.e. vague limits of the probability measures $\delta[\lambda = u^\varepsilon(x)]$, which contain all the information on the limits of nonlinear functions u^ε. In this context, the authors study the problem to derive equations which uniquely determine the Young measure of the data. Some difficulties in the weak convergence arise from "oscillations": The equations of the profiles which asymptotically describe the oscillations depend on the structure of resonances.

In particular, when non-resonances are present, the profile equations are more decoupled. The question is to know whether the existence of resonant phases is the only obstruction for such a decoupling for general families of solutions. This paper gives a positive answer to this question, in one space dimension, either for 3×3 semilinear systems with quadratic right hand side. Next, the paper studies how the decoupling into tensor products of the Young measures is related to compensated compactness.

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