Stability of Classes of Solutions to Partial Differential Relations and Quasiconvexity

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We consider classes of solutions $u : U \to \mathbb{R}^m$ to partial differential relations $u^{(l)}(x) \in K$ a.e. in $U \subset \mathbb{R}^n$. Here $u^{(l)}(x)$ stands for the differential of order $l$ of $u$ at $x \in U$ and $K$ is a set in the space $R_{sym}^m$ of symmetric $l$-linear maps from $\mathbb{R}^n$ into $\mathbb{R}^m$. The stability properties of these classes are described in terms of quasiconvex sets. We study stability in the frameworks of the concepts of stability of classes of mappings which were suggested by A.P. Kopylov. These concepts are one general direction of research into the stability phenomena for classes of mappings and involve some well-known results on stability of conformal and isometric transformations established by M.A. Lavrent’ev, P.P. Belinskii, Yu.G. Reshetnyak, F. John, et al. Gradient Young measures are used in our approach to studying stability problems. Part of the results presented in the talk is joint work with M.V. Korobkov.