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An Idea and Theory of Hypothetical Device for Investigating the Localization Phenomena

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Suggested is an idea of the lamination shear device for investigating the localization phenomena in bulk or soft plastic media. The device consists of apile of laminae with a cavity of rather arbitrary shape cut in it. The cavity isfilled with a medium examined which forms the specimen of rather arbitraryshape. The prescribed uniform shearing of the pile induces the basic shearprocess in the specimen, which is also uniform unless its stability is violated.By means of author's modifications of the well-known Van Hove's theorem, the stability is proved to be preserved up to the loss in strong ellipticity for thematerial deformed, which stipulates the onset of localized instability. Thus, the localization pattern arises on the background of a homogeneous state of thespecimen and is influenced mostly by its shape. Such a combination of theoreticallysubstantiated properties enables in principle to investigate the dependence ofthe localization pattern on the shape of domain of deformation. The stated stillopen question is of great interest for mechanics of the localization phenomena.

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