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Nedyu I. Popivanov* (nedyu@fmi.uni-sofia.bg). *Supercritical and critical cases for 2D and 3D BV problems for quasilinear equations of mixed elliptic-hyperbolic type.*

We prove the nonexistence of nontrivial solutions for some linear classical planar problems studied by Tricomi, Frankl' and Guderlay-Morawetz, with additional nonlinearity having supercritical or critical growth. In the 3D case we study some Morawetz-Protters problems, which are strongly ill-posed even in the case of the wave equation or for weakly hyperbolic case. The results follow from integral identities of Pohožaev type, suitably calibrated to achieve an invariance with respect to anisotropic dilations in the linear part of the equation. In the case of critical growth, the nonexistence principle is established by combining the dilation identity with another energy identity. For boundary value problems in which the boundary condition is imposed on a proper subset of the boundary (i.e. not on the whole boundary), sharp Hardy-Sobolev inequalities are used to control terms in the integral identity corresponding to the lack of a boundary condition. These problems will be discussed not only for the classical solutions, but also in the frame of generalized solution. (Received June 27, 2011)