MR942351 (90h:35032) 35B40 (35L55)
Bloom, C. O. (1-SUNYB); **Kazarinoff, N. D.** (1-SUNYB)
Energy decay for hyperbolic systems of second-order equations.
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Let V be a simply connected, unbounded domain of $\mathbf{R}^3$, with piecewise smooth, star-shaped boundary ∂V. In $(V \cup \partial V) \times [0, \infty)$ an initial-boundary value problem is defined by a system of m second-order differential equations in m unknowns; this system is hyperbolic; the boundary data are Cauchy initial data and Dirichlet data on ∂V.

That problem is studied in three cases. A divergence identity gives rise to two basic "energy identities". The total energy is bounded from above by a multiple of its initial value. A "domain of dependence theorem" is asserted: the solution has compact support in $V \cup \partial V$ for all $t \in (0, \infty)$. Existence and uniqueness theorems can be obtained. An appropriate definition of "the local energy $\mathcal{E}(\cdot)$ of a solution" is given; it depends on $t \in [0, \infty)$. The main theorem is the following assertion: In the three cases under consideration $\mathcal{E}(t) \leq \text{const} \cdot t^{-c} \xi(0)$, where C is a strictly positive constant.

Reviewed by *Jean Leray*