On the well-posedness for second order weakly hyperbolic Cauchy problems under the influences of the regularity of the coefficients

Fumihiko Hirosawa

Department of Mathematics, Nippon Institute of Technology
Saitama 345-8501, Japan

E-mail: hirosawa@nit.ac.jp

We consider the loss of regularity of the solution to the Cauchy problem of second order weakly hyperbolic equations with time depending coefficients. Generally, the solution loses its regularity at the contact points of the characteristic roots, and the order of regularity loss is described by the order of contact and the order of first order derivative of the coefficients. The main purpose of our talk is that the following additional properties of the coefficients: the C^m property and stabilization of the amplitude of the characteristic roots described by an integral, which will be called *the stabilization property*, are essential for precise estimate of the loss of regularity of the solution. Thus, the order of regularity loss is described by some interactions of the following four properties of the coefficients: *contact order of characteristic roots*, *order of differentiability*, *higher order of the derivatives* and *the stabilization property.*