Hyperbolic Equations in L^p

Hyperbolic equations are rarely studied in L^p-spaces. One reason for this is that even standard hyperbolic equations like the wave equation are mostly ill-posed in L^p. This can be proven by using a multiplier theorem introduced by Hörmander in 1960 which gives a necessary condition for functions of the form $\xi\mapsto e^{i\phi(\xi)}$ being L^p-multipliers. We will use this theorem in order to show ill-posedness results for some Schrödinger type and some hyperbolic equations in $L^p(\mathbb{R}^n)$, including the one for the wave equation for $n\geq2$. As a motivation, we will also present some results on the thermoelastic plate equation, a system which fails to be parabolic for most parameters. The terms causing the lack of parabolicity lead to the L^p-theory for hyperbolic equations and will be studied in a detailed way.