Multi-d Shock Waves and Surface Waves

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The stability analysis of shock waves in several space dimensions dates back to the 1950s. At that time it was mainly concerned with practical applications in gas dynamics, and was tackled by means of 'normal modes analysis', which is in fact a matter of algebra. It was revived in the 1980s by Madja's famous work, who put some analysis in the matter and did prove the nonlinear stability of shocks under an *uniform stability condition*. The purpose of the talk is to present recent advances in multi-d shock wave theory *without* the uniform stability condition, that is, when neutral modes do arise at the linear level. Emphasis will be put on neutral modes of finite energy, or surface waves, and their weakly nonlinear counterparts.