IDEAL MHD STABILITY THEORY

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Disruptions in tokamak plasmas are often triggered when the plasma current or pressure get close to operational limits. In this lecture, these limits will be deduced from an ideal (reduced) MHD model. In particular, it will be shown that :

1. plasma stability with respect to internal and external kink modes limits the total current (Kruskal-Shafranov limit) and requires peaked current profiles ;

2. stability with respect to ideal ballooning modes limits the plasma pressure (beta- or Troyon limit).