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Stability of a Tokamak Plasma's Edge[1] ANTHONY WEBSTER, Euratom/UKAEA Fusion Association — The edge of tokamak plasmas strongly affects the plasma's confinement, and can be subject to edge-localised instabilities with the potential to erode plasma facing components in large tokamaks such as ITER. Therefore it would be helpful to be able to control the edge plasma properties as fully as possible, so as to maximise confinement while avoiding damaging instabilities. Surprisingly however, whereas the complicated plasma geometry associated with a separatrix has slowed progress towards a full understanding of a tokamak plasma's edge stability, there are seemingly well understood examples of ideal Magnetohydrodynamic (MHD) instabilities that provide the opportunity for techniques to be developed to control the edge plasma's properties – and as a likely consequence, the properties of its edge stability, confinement, and ELMs. Although our understanding of ideal MHD stability near a separatrix is becoming relatively mature (A.J. Webster & C.G.Gimblett, Phys. Rev. Lett. in press), the description appears incomplete, as will be discussed. Nonetheless, our current understanding of plasma stability is sufficient to suggest simple methods (A.J. Webster, Phys. Plasmas. **16**, 012501, 2009), that in principle allow us to control the plasma's edge pressure gradient (as an example), and potentially the properties and consequences of ELMs. Such experiments should at least allow a greater understanding of the plasma's edge to be obtained.

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