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External Kink Mode in Diverted Tokamaks* A.D. Turnbull, N.M. Ferraro, L.L. Lao, *GA*; J.M. Hanson, F. Turco, *Columbia U*; P. Piovesan, *Consorzio RFX* –In a straight tokamak model, the external kink mode with toroidal mode number n and poloidal mode number m is predicted to be unstable when the edge safety factor, q_{edge}, lies just below a rational value. In a torus, the picture is essentially unchanged and the 2/1 instability in particular is always encountered when $q_{edge}=2$. For a diverted plasma, the edge q is infinite, but, the experimental limit is then $q_{95}= 2$, where q_{95} is at the 95% flux surface. However, no theoretical basis has been established for the importance of q_{95} and ideal predictions indicate stability with $q_{edge}>2$ and $q_{95}<2$; instability is found only when the actual q at the edge is below 2. Two possible solutions present themselves. The observed mode may be destabilized as a result of small 3D error fields. Alternatively, the observed mode may be destabilized by the rapidly increased resistivity at the plasma edge. Both possibilities are examined using ideal and resistive MHD tools in two and three dimensions.

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