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Fusion Burning in Magnetically Confined Toroidal Plasmas[1] R. GATTO, Uniroma1 (Italy), B. COPPI, MIT, A. CARDINALI, CNR (Italy), B. BASU, MIT — The thermonuclear instability in toroidal fusion burning plasmas [1] can manifest itself as a driving factor of modes that are radially localized around closed field lines on rational magnetic surfaces. The radial profile of the electron temperature perturbations can be of two parities: even and odd. In the first case the effective longitudinal thermal conductivity which can hinder the onset of the thermonuclear instability, for realistic values of relevant plasma parameters, can be reduced by the effects of modes involving magnetic reconnection when these have a radial transverse reconnected field with a odd (radial) profile. In the second case magnetic reconnection is shown to have a considerably different effect and is characterized by (reconnected) transverse fields that have an even radial profile. The existence of pairs of spatial "thermonuclear" singularities is pointed out.
[1] B. Coppi and the Ignitor Program Members, Nucl. Fus., 55, 053011 (2015).

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