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Burn Control for the IGNITOR Experiment by External ICRH Heating[1] A. CARDINALI, ENEA, Italy, B. COPPI, M.I.T., G. SONNINO, Université Libre de Bruxelles, Belgium — The non-linear thermal balance equation for thermal equilibrium and stability, is analytically and numerically investigated by including the ICRH external wave heating term in order to control the thermonuclear instability in IGNITOR experiment facility. The expressions for ion and electron thermal coefficients, introduced in the thermal balance equation, are obtained by solving the nonlinear transport equations estimated in the several collisional transport regimes (in particular the banana collisional transport regimes). The scaling law of the thermal coefficients with respect to temperature is obtained by fitting the, magnetic surface, averaged profiles of these coefficients against temperature. The ICRH heating in the IGNITOR experiment, among other applications, is expected to stabilize the power of the thermonuclear burning by automatic regulation of the RF coupled power. Here a scenario is considered where IGNITOR is led to operate in a slightly sub-critical regime by adding a small fraction of He3 to the nominal 50-50 Deuterium-Tritium mixture. The difference between power lost and alpha heating is compensated by additional ICRH heating, which should be able to increase the global plasma temperature via collisions between He3 minority and the background D-T ions.

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