Direct electron heating observed by fast waves in ICRF range on a low-density low temperature tokamak ADITYA.

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Fast wave electron heating experiments are carried out on Aditya tokamak [R=0.75m, a=0.25m, Bt=0.75T, n_e~1-3E13/cc, Te~300eV] with the help of indigenously developed 200 kW, 20-40 MHz RF heating system. Significant direct electron heating is observed by fast waves in hydrogen plasma with prompt rise in electron temperature with application of RF power and it increases linearly with RF power. A corresponding increase in plasma beta and hence increase in stored diamagnetic energy is also observed in presence of RF. We observe an improvement of energy confinement time from 2-4msec during ohmic heating phase to 3-6msec in RF heating phase. This improvement is within the Alcator L-mode scaling for the present experiments. The low-Z impurity radiation and electron density do not escalate significantly with RF power. The direct electron heating by fast wave in Aditya is also predicted by ion cyclotron resonance heating code TORIC.

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