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Peaked Density Profiles in H-mode in Alcator C-Mod¹

J A SNIPES, R BOIVIN, P BONOLI, J GOETZ, M GREENWALD, J IRBY, Y LIN, E S MARMAR, D MOSSESIAN, MIT PSFC — Spontaneous peaking of the electron density profile has been observed to persist throughout the H-mode for many confinement times under some conditions in C-Mod with gas fuelling only. Particularly large peaking factors ($n_{e0}/\langle n \rangle \sim 3$) have been achieved during Ohmic H-mode where the toroidal field was ramped down initially to about 3 T and then ramped back up to as much as 5.2 T while remaining in H-mode. Such peaking occurs both in ELM-free and Enhanced D α H-mode (EDA). The density peaking is measured with a five channel core Thomson scattering system that is cross-calibrated with a visible bremsstrahlung array. Central densities as high as $6 \times 10^{20} \text{ m}^{-3}$ were obtained. When off-axis ICRF heating is added to the high field side at 4.5 T, the density peaking persists. With on-axis ICRF heating at 5.2 T, the density peaking was reduced to a peaking factor of about 1.6. Typical H factors relative to the ITER89P scaling were ~ 1.5 . Total radiated power fractions were $\sim 50\%$. A shoulder on the density profile from about $r/a \sim 0.5$ outward suggests that the peaking may be due to an internal transport barrier.

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Prefer Oral Session
 Prefer Poster Session

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Special instructions: Alcator C-Mod session #

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