

HIGHER FUSION POWER GAIN WITH CURRENT AND PRESSURE PROFILE CONTROL IN STRONGLY SHAPED DIII-D TOKAMAK PLASMAS

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Fusion power gain has been increased by a factor of 3 in DIII-D by tailoring the pressure profile to avoid the kink instability in H-mode plasmas. The resulting plasmas are found to have neoclassical ion confinement. This reduction in transport losses in beam-heated plasmas with negative central shear, is correlated with a dramatic reduction in density fluctuations. Improved MHD stability is achieved by controlling the plasma pressure profile width. In deuterium plasmas the highest gain, the ratio of fusion power to input power, (Q) was 0.0015, corresponding to an equivalent Q of 0.32 in a deuterium-tritium plasma.