

ABSTRACT

Suppression of the resistive wall mode (RWM) has been successfully demonstrated in the DIII-D tokamak by using rotational stabilization in conjunction with a close-fitting vacuum vessel wall. The duration of the high-pressure discharge was extended to hundreds of the wall skin time. Frequently, the plasma pressure reached the ideal-wall MHD kink limit. The confined pressure is up to twice as high as the no-wall ideal MHD kink limit. Near its marginal stability point, the RWM is found to resonate with residual non-axisymmetric fields (e.g., components of the error field). A magnetic feedback system has been used to identify and compensate for the residual non-axi-symmetric fields. This is to the best of our knowledge, the first demonstration of the sustainment of a stable plasma with pressure at levels well above the no-wall pressure limit. This technique is expected to be applicable to other toroidal devices.