

## **Control of plasma stored energy for burn control using DIII-D in-vessel coils**

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**Abstract.** A new approach has been experimentally demonstrated to control the stored energy by applying a non-axisymmetric magnetic field using the DIII-D in-vessel coils to modify the energy confinement time. In future burning plasma experiments as well as magnetic fusion energy power plants, various concepts have been proposed to control the fusion power. The fusion power in a power plant operating at high gain can be related to the plasma stored energy and hence, is a strong function of the energy confinement time. Thus, an actuator that modifies the confinement time can be used to adjust the fusion power. In relatively low collisionality DIII-D discharges, the application of non-axisymmetric magnetic fields results in a decrease in confinement time and density pumpout. Gas puffing was used to compensate the density pumpout in the pedestal while control of the stored energy was demonstrated by the application of non-axisymmetric fields.

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