

## **Fast Ferrite ICRF Matching System on Alcator C-Mod\***

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The loading of an ICRF antenna can vary significantly in a plasma discharge due to L-H mode transitions, the occurrence of edge localized modes and changes in plasma shape. The existing matching systems in Alcator C-Mod are only tunable between shot. To avoid excessive VSWR to the transmitters, the RF power has to be shut off when mismatch happens. This imposes limitations on the range of plasma parameters that the antennas can couple effectively. A double-stub fast ferrite matching system has recently been developed. The equivalent electrical length of the stubs can be controlled dynamically in a plasma discharge, by changing the magnetic permeability of the ferrite material using a magnetic field. The currents in the magnetic coils are controlled real-time through a digital feedback system (200  $\mu$ s per iteration). Bench tests have shown that this fast ferrite system will allow a good loading match under most plasma conditions in Alcator C-Mod. Initial results of the system running at high RF power and at different plasma conditions will be presented.

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