

Abstract Submitted
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Progress in low-aspect-ratio RFP studies in RELAX SADAO
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TOG, U. Wisconsin, R. PACCAGNELLA, Consorzio RFX — Equilibrium analyses
have shown that the aspect ratio A is one of the important parameters for opti-
mization of the RFP configuration because it affects the q profile or fraction of the
pressure-driven bootstrap current. RELAX ($A=R/a=0.5\text{m}/0.25\text{m}$) is a low- A RFP
machine to explore the potential advantages of low- A configurations. The discharge
and plasma parameters in RELAX to date are as follows: plasma current up to
100kA, discharge duration of up to 2.5ms, electron density in the range from 0.2
to $2.0 \times 10^{19} \text{ m}^{-3}$, and electron temperature $<100\text{eV}$ from double-filtered soft-X
ray (SXR) measurements. Characteristic plasma behaviors in very shallow reversal
and extremely deep reversal regions have been reported. A non-linear 3-D MHD
simulation for $A=2$ RFP configurations has revealed that the quasi-single helicity
(QSH) state with experimentally observed $m/n=1/4$ structure can be realized in
shallow reversal cases. New diagnostics are being installed in RELAX: a soft-X ray
(SXR) imaging system for the study of 3-D structural studies on MHD instabilities,
Thomson scattering system, and 140GHz interferometer for higher density regimes.
The vacuum vessel has been covered with 64 saddle coils for RWM stabilization but
with limited number of power supplies at present.

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