

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Evaluation of 3D Structure in RELAX RFP with SXR Imaging Technique AKIO SANPEI, SADA O MASAMUNE, KAZUAKI DEGUCHI, SEIYA NAKAKI, HIROYUKI TANAKA, KANAE NISHIMURA, HARUHIKO HIMURA, Kyoto Institute of Technology, SATOSHI OHDACHI, NAOKI MIZUGUCHI, National Institute for Fusion Science — In a low-A RFP machine RELAX ($R = 0.51$ m/ $a = 0.25$ m ($A = 2$)), a quasi-periodic transition to quasi-single helicity (QSH) state has been observed. During the QSH state, the fluctuation power concentrates in the dominant $m = 1/n = 4$ mode, and a (toroidally rotating) 3-D helical structure has been observed with radial array of magnetic probes [1]. We applied a high-speed (10-microsecond time resolution) soft-X ray (SXR) imaging diagnostic system to take SXR images during the QSH state, identifying the characteristic helical SXR structures which suggest hot or dense helical core [2]. The high-speed SXR imaging system has been extended to take the images from tangential and vertical directions simultaneously to observe 3-D dynamic structures of the SXR emissivity. The time evolution of the 3-D helical structures associated with the QSH state will be reported, together with some discussion on 3-D reconstruction techniques.

[1] Oki et al., Plasma Fusion Res. vol.7, 1402028 (2012).

[2] Sanpei et al., IEEE Transaction Plasma Science, vol.39, 2410 (2011).

Akio Sanpei
Kyoto Institute of Technology

Date submitted: 18 Jul 2012

Electronic form version 1.4