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**Tilt instability at formation phase of field-reversed configuration plasma** YUKI KANAMARU, TOSHIYUKI FUJINO, HIROSHI GOTA, TOMOHIKO ASAI, TSUTOMU TAKAHASHI, YASUYUKI NOGI, College of Science and Technology, Nihon University — A field-reversed configuration (FRC) plasma is produced by a negative-biased theta-pinch. It is known that the FRC attains to an equilibrium phase after an axial contraction of the plasma at the formation phase. However, when high bias field is applied to the plasma, the FRC is disrupted due to the strong axial contraction. The present report is aimed to investigate the disruption mechanism of the FRC in detail. For this purpose, two kinds of diagnostic systems are constructed, which are a magnetic probe array with sine-cosine windings and an optical fibers array without any lens at the front facets of the fibers. A fluctuating component in the confinement field and the radiation of the plasma with  $n=1$  and 2 toroidal modes can be analyzed using the diagnostic systems. It is found that the toroidal modes appear associating with the axial contraction. Their amplitudes increase when the FRC is disrupted. The experimental evidence is compared with a result of a computer simulation using a plasma model with a tilting configuration inside a separatrix.

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