Observation of space and energy distributions of high-energy electrons produced in ECH plasmas of LHD

S.Muto, S. Morita, S.Kubo, H.Igami, Y.Yoshimura, H.Takahashi, and T.Shimozuma

National Institute for Fusion Science,322-6 Oroshi-cho, Toki 509-5292, Japan

e-mail mutos@ms.nifs.ac.jp

The hard x-ray spectrum has been studied with x-ray pulse-height analyzer (PHA) in Large Helical Device (LHD). The hard x-ray emissions have been observed in high-temperature plasmas heated by electron cyclotron heating (ECH). The radial distribution of the hard x-ray emissions is successfully derived from the line-integrated spectrum obtained with PHA through Abel inversion. When the bulk electron density ranges at 2.0×10^{12} cm^{-3}, the hard x-ray emissions are measured to be the most intense [1]. From the analysis of the data it is clearly understood that the high-energy electrons accelerated perpendicular to the magnetic field are localized in the radial position of $|\rho| \leq 0.2$. In addition the mean energy of the high-energy electrons is measured to be more than 100 keV. The confinement time of the high-energy electrons can be estimated from the exponential decay after turning off the ECH pulse. The present analysis suggests the confinement time of 80 msec.

[1] S.Muto *et al.*, Rev.Sci.Instrum. **74**, (2003) 1993.