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Research of the Electron Cyclotron Emission with Vortex Property excited by high power high frequency Gyrotron YUKI GOTO, Nagoya Univ., SHIN KUBO, National Institute for Fusion Science, Nagoya Univ., TOHRU TSUJIMURA, HIDENORI TAKUBO, National Institute for Fusion Science — Recently, it has been shown that the radiation from a single electron in cyclotron motion has vortex property. Although the cyclotron emission exists universally in nature, the vortex property has not been featured because this property is normally cancelled out due to the randomness in gyro-phase of electrons and the development of detection of the vortex property has not been well motivated. In this research, we are developing a method to generate the vortex radiation from electrons in cyclotron motion with controlled gyro-phase. Electron that rotates around the uniform static magnetic field is accelerated by right-hand circular polarized (RHCP) radiation resonantly when the cyclotron frequency coincides with the applied RHCP radiation frequency. A large number of electrons can be coherently accelerated in gyro-phase by a RHCP high power radiation so that these electrons can radiate coherent emission with vortex feature. We will show that vortex radiation created by purely rotating electrons for the first time.

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