

Observation of the Ion Cyclotron Emission due to D-D fusion-product H-ions on JT-60U

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To study high frequency fluctuations in the ion cyclotron range of frequency (ICRF) is one of the important issues for nuclear fusion plasma researches. On JT-60U, the ion cyclotron emissions (ICEs) detected as magnetic fluctuations are observed by using ICRF antennas as pickup loops. ICEs are spontaneously excited by high energy ions produced by injected beams and D-D fusion-reactions. On JT-60U, ICEs due to injected D beams ; ICE(D), D-D fusion-products T-ions, ³He-ions and H-ions ; ICE(T), ICE(³He) and ICE(H) are identified. In this paper, we investigate ICE(H) which is detected separately from the second harmonic ICE(D). Because D-ion has twice the mass and the same charge of H-ions, the frequency of ICE(H) is expected to be the same frequency of the 2nd-ICE(D), where the frequency correspond to the cyclotron frequency of the outermost magnetic surface near the outer mid-plane. It has been suggested that ICEs due to fusion-products ions have finite toroidal wave numbers and ICEs(D) have no toroidal wave numbers [1]. Therefore, ICE(H) is identified from the measurement of the toroidal wave numbers.

ICEs are attributed to the magneto acoustic cyclotron instability. However, the behavior of ICE(H) is quite different from that of ICE(³He). The appearance of these ICEs depends strongly on the density. We are investigating the orbits of fusion-product ions by using computer code.

[1] M. Ichimura et al, Nucl. Fusion **48** (2008) 035012