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Two-dimensional structure of volume recombination in JT-60U detached divertor plasmas FUJIMOTO KAYOKO, NAKANO TOMOHIDE, KUBO HIROTAKA, Japan Atomic Energy Agency, SAWADA KEIJI, Shinshu University, TAKIZUKA TOMONORI, KAWASHIMA HISATO, SHIMIZU KATSUHIRO, ASAKURA NOBUYUKI, Japan Atomic Energy Agency — The volume recombination in detached divertor plasmas is a key process to reduce the ion flux to the divertor plates. Two-dimensional measurement is one of the ways to investigate a spatial structure of the volume recombination. In this work, the deuterium Balmer-series lines (D_α, D_β, ..., D_θ) from a detached divertor plasma were observed two-dimensionally with a spatial resolution of $\sim$ 1 cm and were reconstructed into two-dimensional emissivities with a tomography technique. The ratio of the D_β to the D_α emissivity was compared to that calculated by the collisional-radiative model. This ratio could not be explained only by the excitation of D by electron impact, indicating that the volume recombination contributed to the D_β emission. This is the case for the region above the inner strike point with $\sim$ 8 cm and $\sim$ 4 cm, respectively, in the r- and the z-direction on the poloidal cross-section. In this region, from the ratios of the D_α, D_β, ..., D_θ emissivities, the electron density and temperature were evaluated to be $\sim$ 1E20 m^{-3} and < 0.3 eV, respectively.

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