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Impact of plasma core profiles on MHD stability at tokamak edge pedestal NOBUYUKI AIBA, HAJIME URANO, Japan Atomic Energy Agency — Suppression and/or mitigation of large amplitude edge localized modes (ELMs) is one of the critical issues for ITER. In JET quasi-double-null plasmas, both high-$\beta_{\rm p}$ and high-$l_{\rm i}$ are necessary to obtain small amplitude "grassy" ELMs [1], and the origin of grassy ELM is thought as the ballooning mode [2], where $l_{\rm i}$ is plasma internal inductance. We pay attention to these conditions with the assumption that pedestal transport phenomenon in grassy ELM regime is governed by the kinetic ballooning mode stability as EPED1 model [3], and discuss numerically impact of plasma core profiles on MHD stability at tokamak edge pedestal. For example, by making core pressure profile peaked with fixed pedestal width predicted with EPED1 model, current density increases near magnetic axis; namely, $l_{\rm i}$ becomes larger. This widens the difference between poloidal flux on axis and that at plasma surface, and reduces the pressure gradient and current density near pedestal. Such a change of pedestal condition due to varying plasma core profiles has impact on edge MHD stability.

[1] G. Saibene et al., Nucl. Fusion 45 (2005) 297.
[2] N. Oyama et al., Nucl. Fusion 50 (2010) 064014.
[3] P. B. Snyder et al, Nucl. Fusion 49 (2009) 085035.

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