Abstract Submitted
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LH-transition Prevented by Ballooning Instability in Negative Triangularity DIII-D Discharges[1] SAMULI SAARELMA, General Atomics, MAX AUSTIN, U. Texas, ALESSANDRO MARINONI , MATTHIAS KNOLKER, CARLOS PAZ-SOLDAN, General Atomics, LOTHAR SCHMITZ, UCLA, PHILIP SNYDER, General Atomics, DIII-D TEAM TEAM — The LH-transition is suppressed in DIII-D when the top triangularity is made sufficiently negative and plasma instead stays in L-mode well above the LH power threshold in positive triangularity shape [1]. The ideal MHD stability analysis finds that there is a drastic change in stability limit for the local infinite-n ballooning modes when the top triangularity is made negative enough. The lowered ballooning stability limit prevents the edge pressure gradient from increasing, thus preventing the LH-transition and the pedestal formation. The modelling also shows that if the top triangularity is strongly negative the bottom triangularity does not affect the stability boundary as long as it stays less negative than the top triangularity. The predictive analysis using the EPED model [2] shows that even if H-mode were achieved in a negative triangularity discharge, it would have very low pedestal pressure and would not benefit from the core-edge synergy that is driven by the stabilizing effect of the increasing Shafranov-shift on finite-n peeling-ballooning modes seen in plasmas with positive triangularity. [1] M. Austin et al., Phys. Rev. Lett. 122, 115001 (2019) [2] Snyder P.B. et al Phys. Plasmas 16, 056118 (2009)

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