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Investigation of detachment in Double-Null configurations in the TCV tokamak. OLIVIER FEVRIER, STEFANO CODA, CHRISTIAN THEILER, HUGO DE OLIVEIRA, BASIL P. DUVAL, BENOIT LABIT, ROBERTO MAURIZIO, HOLGER REIMERDES, EPFL, SPC, Switzerland, ANDREW THORNTON, CCFE, United Kindgom, TCV TEAM[1], MST1 TEAM[2] —
Safe power exhaust in future fusion reactors will require, at the least, partially detached divertor operation. Alternative divertor configurations could facilitate access to such a regime. In particular, Double-Null (DN) configurations allow splitting most of the exhaust power between two outer legs and potentially reaching higher level of radiation thanks to the presence of two X-Points. In this work, we investigate the detachment on TCV in DN geometries with different outer leg positions, including a double Super-X configuration. Preliminary results show that detachment onset, as measured by the movement of the CIII front away from the targets, happens at lower density than in equivalent Lower Single-Null (LSN), while, for the same line-averaged density <ne>, a higher fraction (between 10% and 50%, depending on shape and <ne>) of the input power is radiated. However, this enhanced accessibility of the detached regime appears to come at the price of a reduced detachment window. The double-null configurations disrupt at lower (between 10% - 20%) line-averaged densities than the equivalent LSN, after a quick movement of the CIII front towards the X-Point.

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