

Abstract Submitted  
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**Doublet Configuration Plasmas on the TCV Tokamak** BASIL DUVAL, HOLGER REIMERDES, EPFL/SPC, JOYEETA SINHA, ITER/France, STEFANO CODA, JEAN-MARC MORET, EPFL/SPC, TCV TEAM — Alternative magnetic shapes and plasma operational regimes are being re-examined. A Doublet uses a vertical multiplet, predicted to improve MHD stability, lower vertical instability growth rates and increase plasma beta limits [Jensen 1975]. Plasma exhaust has one plasma core's divertor aimed into a second, up/down symmetric, core. Revisited on TCV, a 260-kA doublet discharge, featuring a spontaneous transport barrier in the separatrix region is presented [Duval 2018]. Two separate single core breakdown/plasma ramp up limited configurations top/bottom of the highly open TCV vacuum vessel were run, then two simultaneous nulls were attempted. With Ohmic heating alone, the upper lobe drifted to the lower after 20ms (60kA in each lobe). Independent 0.5-MW X2 ECH gyrotrons aimed at each lobe achieved a total plasma current of 260kA disrupting after 20ms without movement of the lobe centers. Both lobes appeared to heat near equally, independently ECH targeting. A strong temperature gradient in, the separatrix region, (within the mantle), possibly explains why independent lobe EC-heating control was ineffective. The surprising position and plasma equilibrium stability of the TCV doublet indicate a rich future research target where strike point interactions are avoided naturally.

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