Stationary ELM-free H-mode on TCV

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By heating an ohmic ELMy H-mode target using vertically launched 3rd harmonic X-mode ECRH (X3), it was possible to obtain coupled power up to ≈1.3MW which was much greater than the H-mode power threshold; ≈500kW. These discharges often transited to an ELM-free H-mode regime with constant electron density and stored energy in which the stored energy and toroidal beta both doubled. The maximum, achieved toroidal beta was 2.5% while the ideal beta-limit for these discharges was 3.5%. The recycling light level was high compared to the baseline ohmic H-mode level and the fluctuations in the recycling light level were correlated with core MHD. The energy confinement time was high, $H_{IPB98(y,2)}$≈1.7, and was limited by core MHD. Measurements of ion temperature profiles and rotation velocity showed that the mid-radius ion temperature increased from 500eV to 1keV while the plasma rotation increased also from 5kms^{-1} to 50kms^{-1}. An overview of these experiments will be presented.