

Abstract Submitted  
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**Synergetic second and third harmonic electron cyclotron power absorption in TCV: experiment and Fokker-Planck modeling** SILVANO GNESIN, TIMOTHY GOODMAN, STEFANO CODA, CRPP-EPFL, JOAN DECKER, YVES PEYSSON, EURATOM-CEA Cadarache — The TCV tokamak is equipped with nine electron cyclotron (EC) wave gyrotron/launcher systems: six 0.5 MW in the 2nd harmonic X-mode (X2) and three 0.5 MW in the 3rd harmonic X-mode (X3). TCV experiments have been expressly devised to study the X2/X3 interplay, especially through the dynamics and transport properties of the suprathermal electron population generated primarily by X2 and its influence on the X3 wave absorption. Fokker Planck modeling of X2/X3 TCV experiments with the quasilinear fully relativistic LUKE code, coupled with the C3PO ray-tracing module and the R5X2 bremsstrahlung module, is presented here. Two series of experiments are discussed: 1) X2/X3 synergy when both X2 (82.7 GHz) and X3 (118 GHz) waves are injected into the plasma and 2) X2/X3 synergetic absorption at the same frequency (82.7 GHz). The role of suprathermal electron transport has been investigated by comparing the bremsstrahlung emission measured by a hard X-ray camera with the simulated signal.

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