

Experimental studies of ECRH/ECCD effects on Tearing Mode stability using the new TCV real-time control system

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Experimental studies of ECRH/ECCD effects on Tearing Mode stability using the new TCV real-time control system OLIVIER SAUTER, FEDERICO FELICI, TIMOTHY GOODMAN, JAMES PALEY, STEFANO CODA, BASIL DUVAL, JEAN-MARC MORET, EPFL-CRPP, Association Euratom-Confédération Suisse, CH-1015 Lausanne, Switzerland, TCV TEAM — While ECRH/ECCD will be the main method for suppressing NTMs in ITER, some aspects of the effect of localised heating and current drive on the mode stability need further investigation. Using the new digital TCV control system we are able to fully exploit the flexibility of the TCV multi-beam EC system for detailed studies of tearing mode formation and suppression. An event-based real-time controller is used, which reacts to the appearance of Tearing Modes by varying the EC injection angles and power. The power can also be modulated with variable phase with respect to the island, allowing to study the effect of heating in the island O or X point. We present not only the experimental results but also a practical demonstration of the use of the new TCV control system. Due to its simple design and implementation, the session leader can rapidly react to changes between shots and change the controller behaviour as the progress of the experimental session requires.

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