

# Sawtooth period pacing and locking by EC power control on TCV

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**Sawtooth period pacing and locking by EC power control on TCV**<sup>1</sup> TIMOTHY GOODMAN, FEDERICO FELICI, JONATHAN GRAVES, OLIVIER SAUTER, CRPP-EPFL, Lausanne, GERT WITVOET, MENNO LAURET, MARCO DE BAAR, TU Eindhoven, GERD VANDERSTEEN, VU Brussels, TCV TEAM — Recent experiments on TCV have demonstrated two new techniques to precisely control the timing of each individual sawtooth crash by modulating the power of sawtooth stabilizing EC waves. The first technique, known as sawtooth pacing [1], the EC power is controlled in real-time and is reduced at a pre-determined interval after the previous sawtooth crash. This causes the following crash to occur at a predictable and repeatable time after each reduction of the power. The second method [2] uses a pre-programmed EC modulation waveform with a given period and duty cycle. For certain combinations of period and duty cycle the sawtooth period locks to the period of the modulation with a given relative phase. The approaches are closely related and both have been used to reliably control the sawtooth cycle period, known to affect Neoclassical Tearing Mode triggering.

[1] T.P. Goodman, et.al, Phys. Rev. Lett., vol. 106, 245002

[2] G.Witvoet, et al., Nucl. Fusion (submitted)

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Stefano Coda  
CRPP-EPFL

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