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National Centre for Synchrotron Science



Ansto

Australian Synchrotron

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## Improving Beam Stability with a Fast Orbit Feedback System

The fast orbit feedback system in development at the Australian Synchrotron aims to improve the stability of the electron beam by reducing the impact of moving insertion devices and targeting orbit perturbations at the mains frequency (50 Hz, 100 Hz and 300 Hz). The feedback system is designed to have a unity gain at a frequency greater than 300 Hz using a PI controller with harmonic suppressors in parallel to specifically target perturbations at the mains frequency and its harmonics. In the lead up to the project completion at the end of 2016, a prototype system based on standard PCs running CentOS 7 with the PREEMPT patch was used. The effectiveness of a fast orbit feedback system is demonstrated by the prototype system where the integrated RMS motion up to 300 Hz was reduced by 75% to 90%.

### Keywords or phrases (comma separated)

Feedback, Beam Stability, Source

### Are you a student?

No

### Do you wish to take part in the Student Poster Slam?

No

### Are you an ECR? (<5 yrs since PhD/Masters)

No

### What is your gender?

Prefer not to say

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**Track Classification :** Technique Development