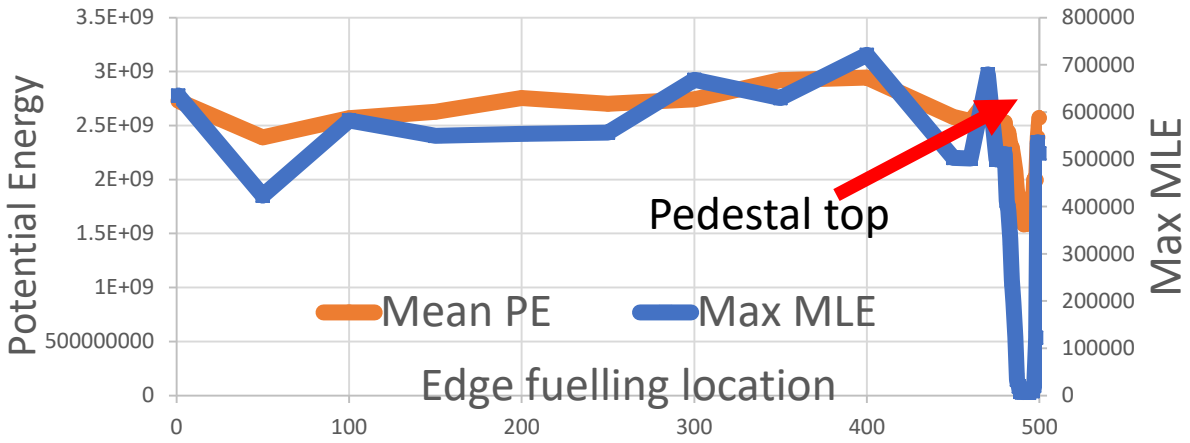
Edge fuelling decimates avalanche size in a sandpile model for ELMs

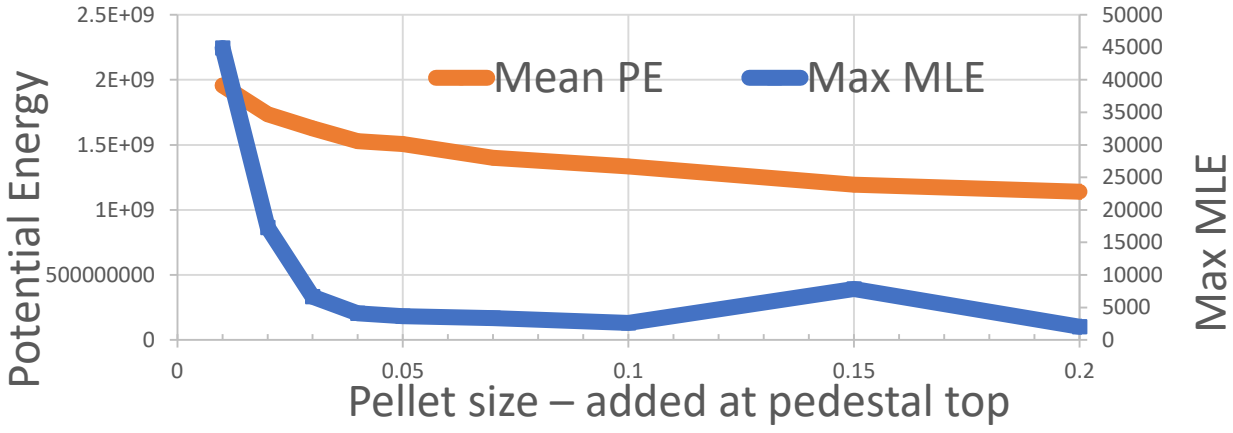
TH/P5-1
Bowie Hole
Australian National University

Adding constant fuelling at sandpile pedestal top significantly reduces avalanche size

- 95-99% reduction in avalanche (MLE) size, ~30% reduction in system energy
- Best results for pedestal top fuelling ~2.5% of core fuelling
- Continuous fuelling model is valid for discrete fuelling scenario of ITER



- Results depend on fuelling location (top), and fuelling amount (bottom).
- Optimal location ~top of pedestal
- Optimal rate ~2.5% of core fuelling



'Pelletizing' 2.5% pedestal fuelling to ITER relevant 45 pellets/sec, assuming ablation time of ~1ms, gives very similar results to constant fuelling ~ 99% reduction in avalanche size