Numerical Experiments with Wes's Program II June 11, 2007

These figures correspond to "Fixed period pacing, Effects of Delta" appearing on Hassan's SITR website. Here, the APD restitution function is

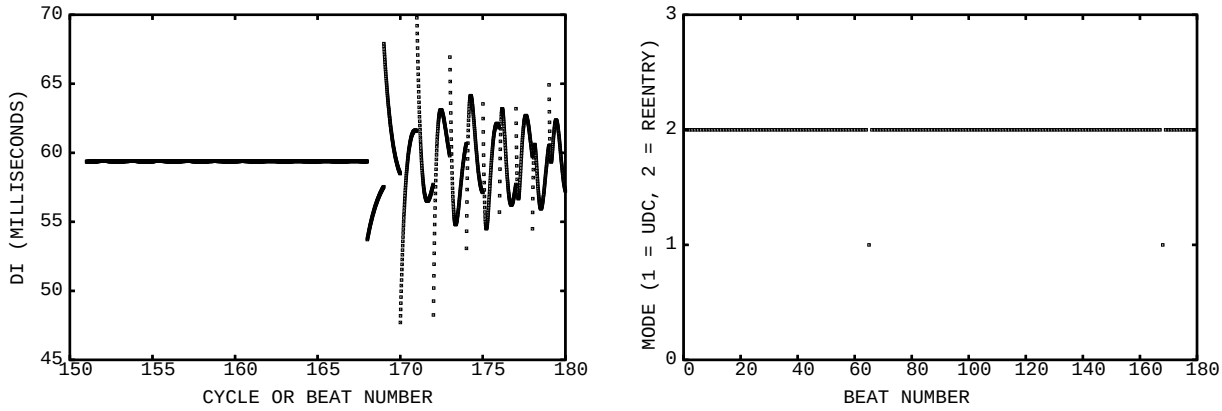
$$f(t) = a - be^{-\sigma t} + pe^{-\gamma(t-\tau)^2} + \frac{(\text{new c})(t - \text{new d})}{(t - \text{new d})^2 + \text{new k}} - 8e^{-0.025(t-80)}.$$

DEFAULT PARAMETERS:

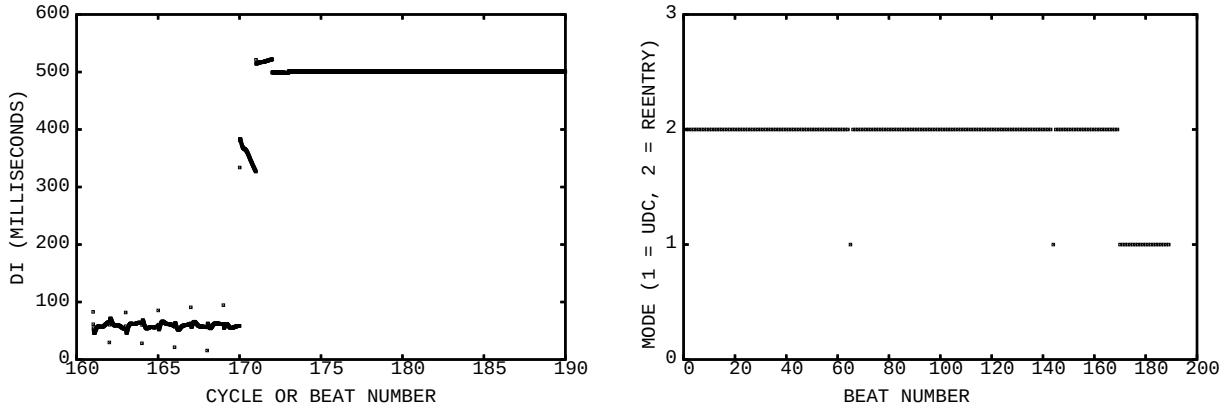
Quantity	a	b	σ	p	γ	τ	new c	new d	new k
Value	350	157	0.0021	-20	0.0004	136	1700	82	1200

Quantity	c	d	ΔL	ω	α	s	DI^*	DI^{**}	B_n	δ_2	δ_1	m
Value	0.07	1.0	0.125	0.02	0.0	0.05	15.4176	171.699	800	5 0	16	100

Above, δ_2 was the δ-value associated with reentry and δ_1 was the δ-value associated with UDC mode. Although δ_1 was set to 16, it will be convenient to let it equal DI^* in future simulations. *Initial DI was 60 in all cells unless otherwise indicated.*

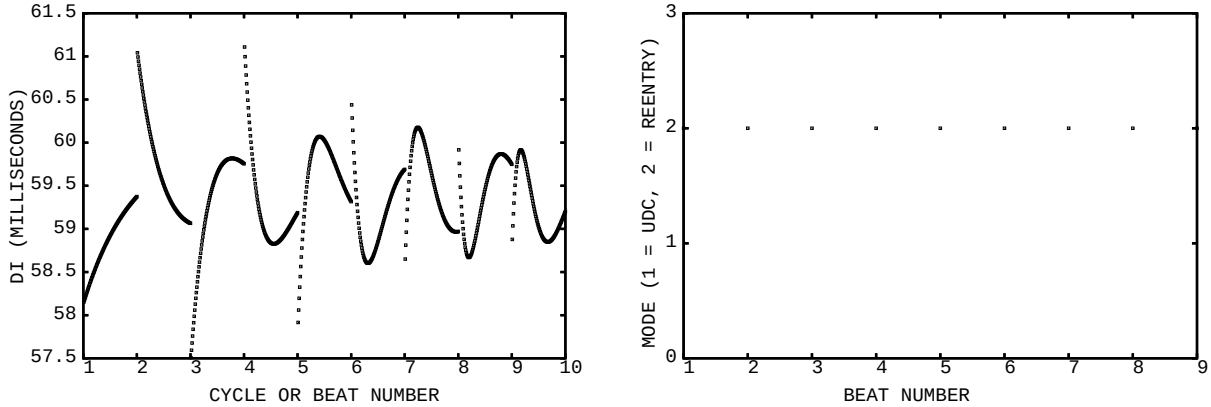


Run 1.1: Default parameters. Reentry interrupted by stray pulses (Fail T3) in beats 65 and 168.

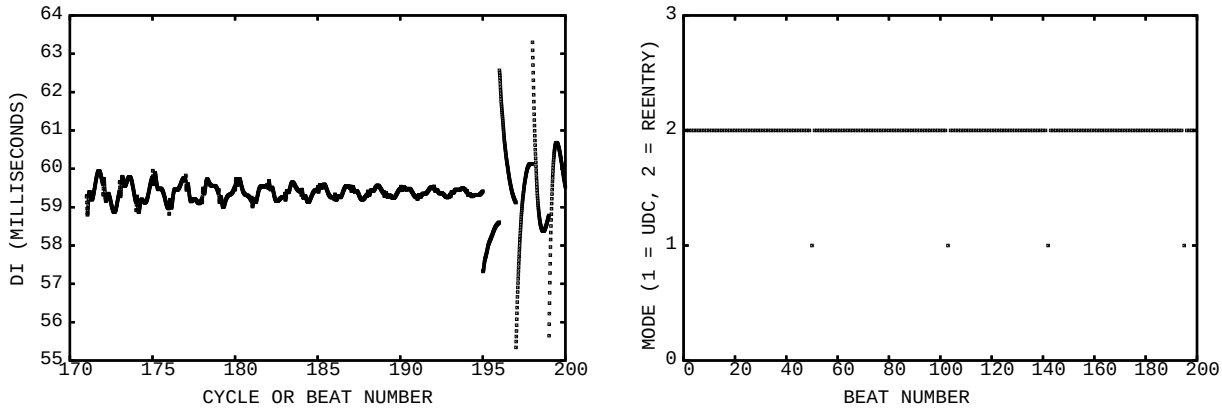


Run 1.2: $\delta = 46$. Reentry interrupted by failure of T3 in Beats 65 and 144. Fail T4 in Beat 170, leading to sustained UDC mode.

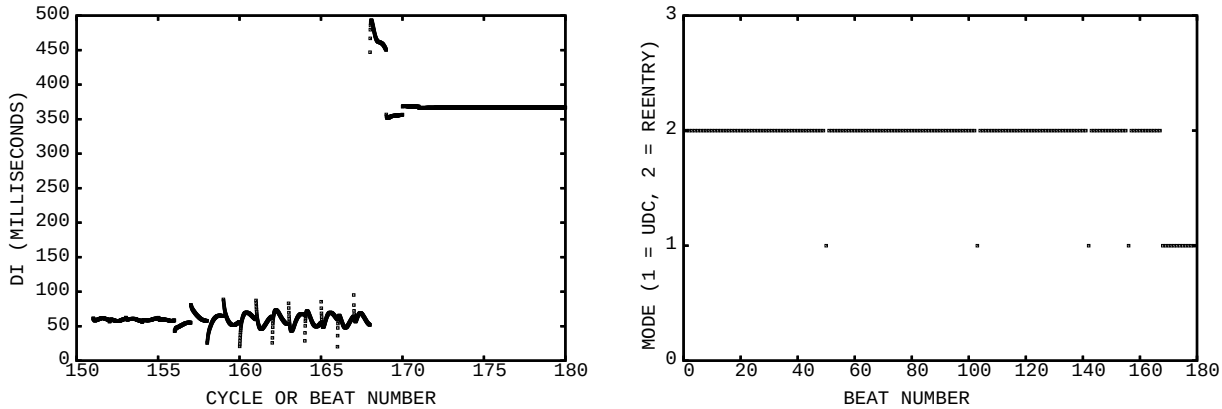
In Runs 2.#, use default parameters except that the pacing period B_n is changed to 650.



Run 2.1: $\delta = 50$. Sustained reentry. Steady-state DI is 59.3845.

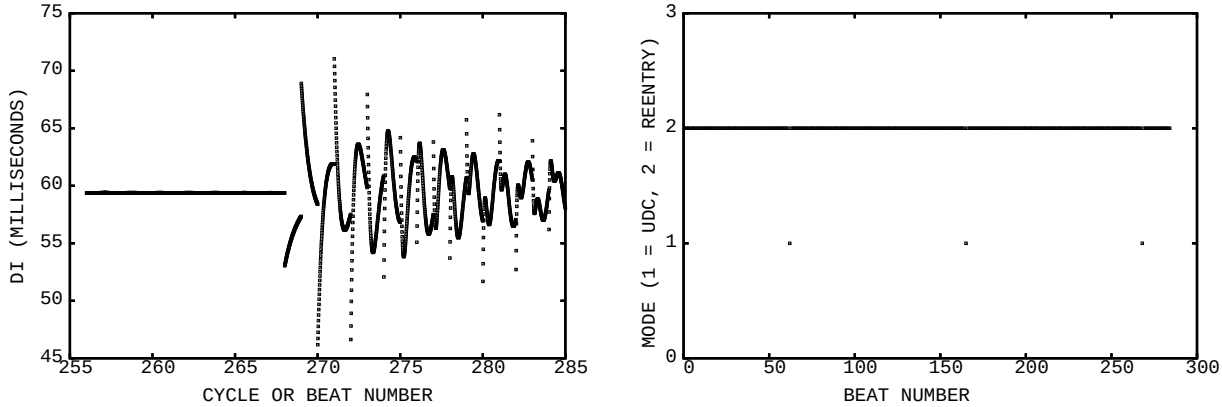


Run 2.2: $\delta = 45$. Failure of T3 in beats 50, 103, 142, and 195.

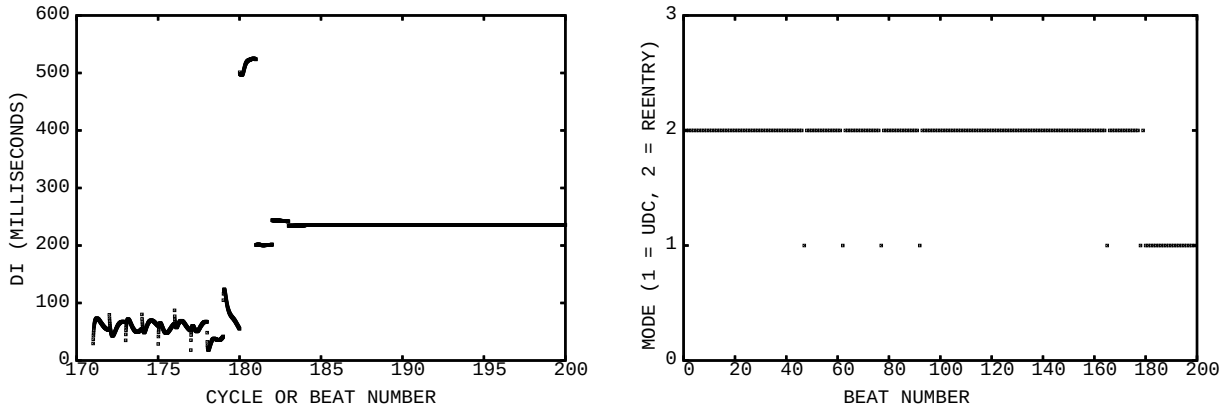


Run 2.3: $\delta = 40$. Failure of T3 in beats 50, 103, 142, 156. Failure of T4 in Beat 168, Cell 1 terminates reentry leading to steady UDC mode.

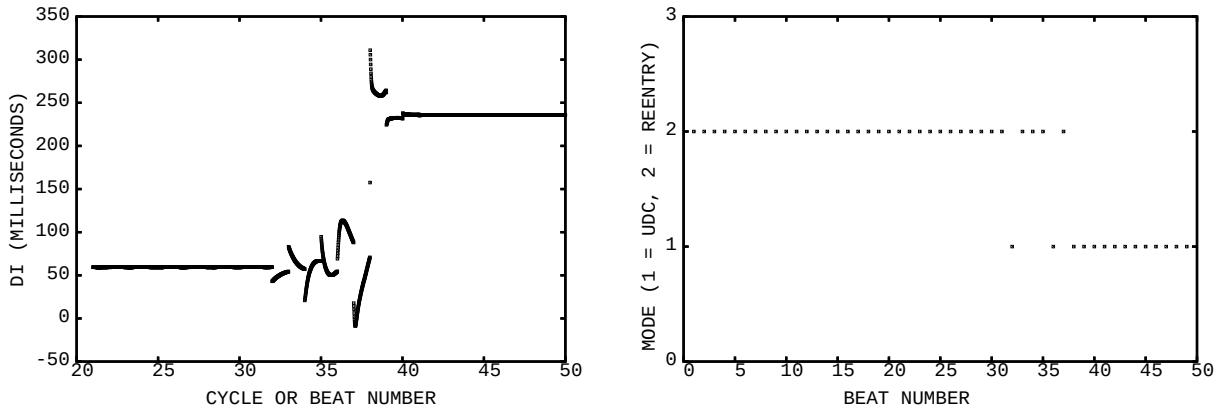
In Runs 3.#, use default parameters except that pacing period B_n is changed to 500.



Run 3.1: $\delta = 50$. Reentry interrupted by failure of T3 in Beats 62, 165, and 268.

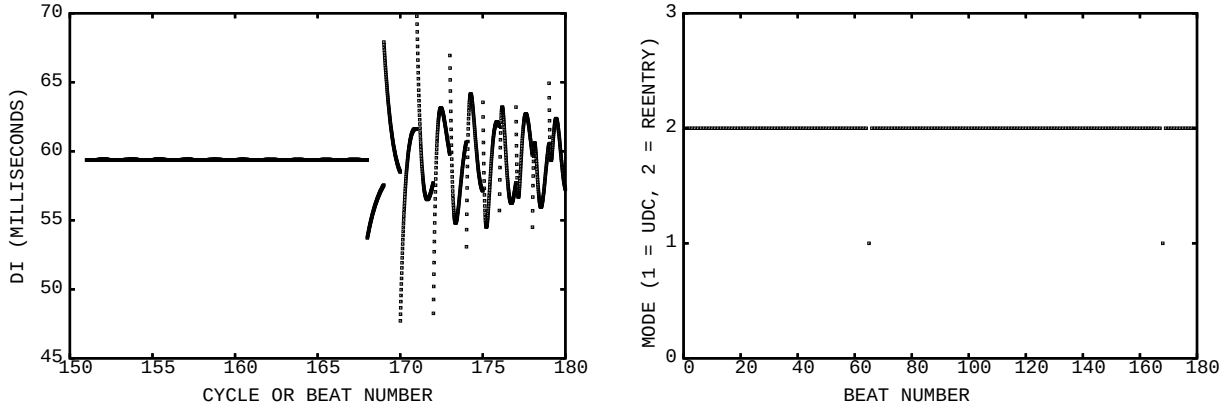


Run 3.2: $\delta = 45$. Reentry interrupted by failure of T3 in Beats 47, 62, 77, 92, 165 and 178. Failure of T4 in Beat 180 leads to steady UDC mode.

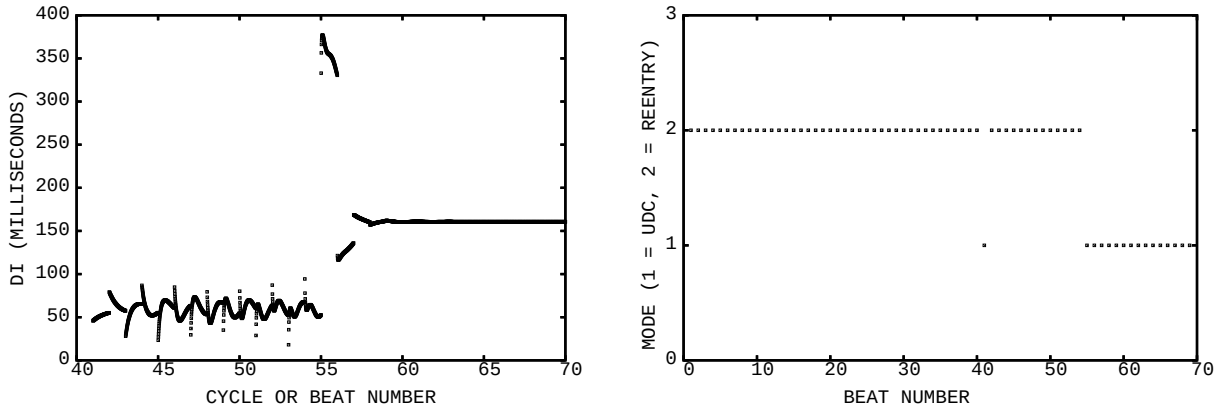


Run 3.3: $\delta = 40$. Reentry interrupted by failure of T3 in Beat 32. Then T4 fails in Beat 36, Cell 1. Then T4 fails again in Beat 37, Cell 2, leading to steady UDC.

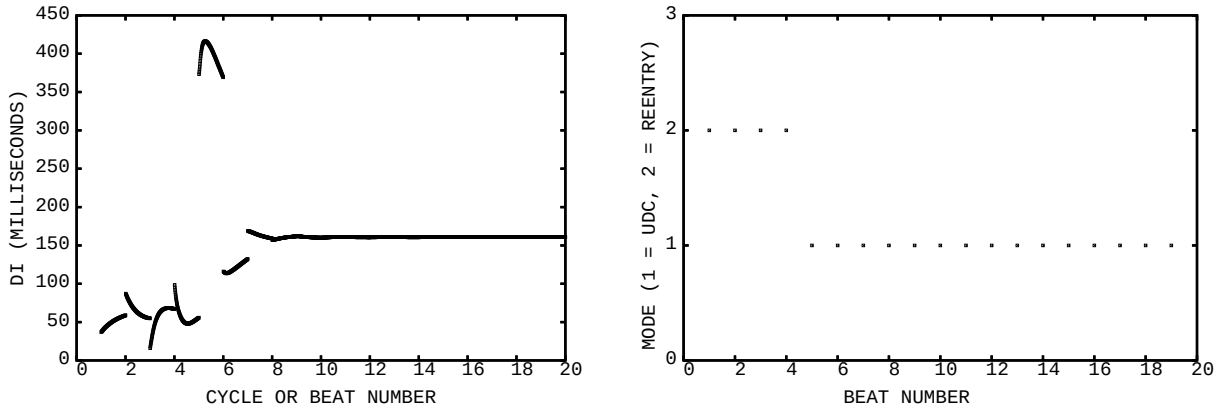
In Runs 4.#, use default parameters except that pacing period B_n is changed to 400.



Run 4.1: $\delta = 50$. Same as Run 1.1. Fail T3 in Beats 65 and 168.



Run 4.2: $\delta = 45$. Reentry interrupted by failure of T3 in Beat 41. Failure of T4, Beat 55, Cell 1 leads to steady UDC mode.



Run 4.3: $\delta = 50$ and initial DI in each cell is 70. Fail T4, Beat 5, Cell 1 and get steady UDC mode.