Numerical Experiments with Wes's Program April 16, 2007

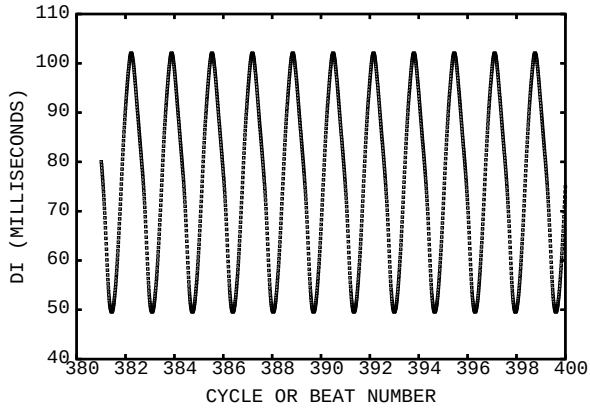
Goal is to produce figures corresponding to some of the runs that Hassan has already run. In this set of notes, the *REFERENCE PARAMETER SET* is as follows:

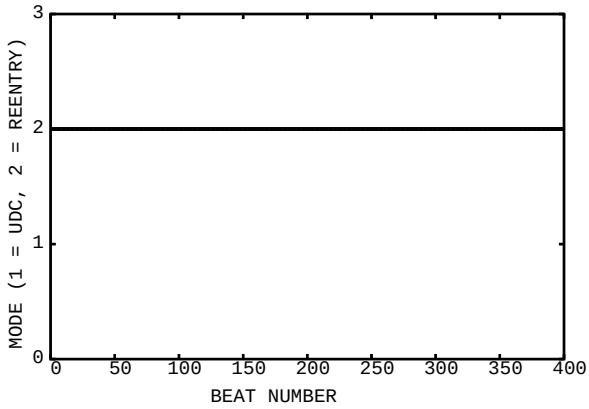
Quantity	a	b	σ	p	γ	τ	new c	new d	new k
Value	442	257	0.0013	-13	0.00083	136	1285	87	980

Quantity	c	d	ΔL	ω	α	s	DI^*	DI^{**}	B_n	δ_2	δ_1	m
Value	0.07	1.3	0.15	0.02	0.0	0.05	15.4176	171.699	400	120	16	100

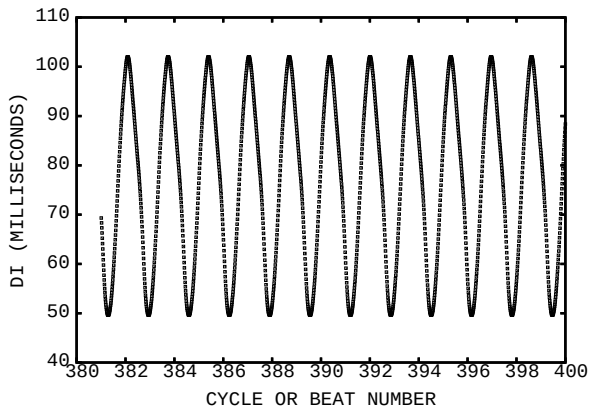
Note that the first row shows parameters relating to APD restitution. Rather than including the parameters for the generated and activation current restitution curves, I simply included the values of DI^* and DI^{**} that were used in my simulations. The value of DI^{**} may differ from the one that Hassan used, but this doesn't matter because I disabled Threshold 1 for now. None of these runs use variable pacing intervals, so B_n is simply a constant. 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. In what follows, $DI_0 = 100$ means the initial DI value for all cells (all m of them) was 100, and $DI_0 = 60$ means all initial DI values were set to 60.

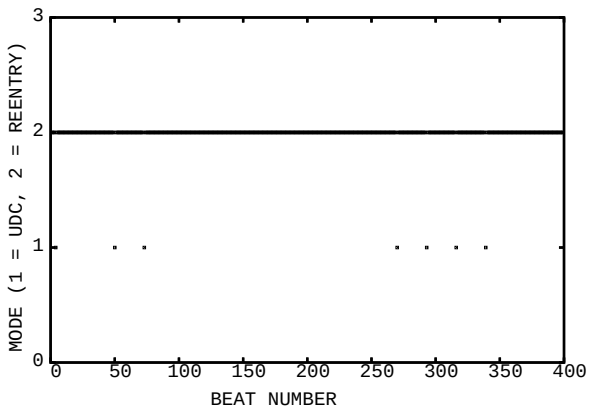
RUN 1: Uses the reference parameters above and $DI_0 = 100$. Sustained reentry with quasiperiodic variation of DI.



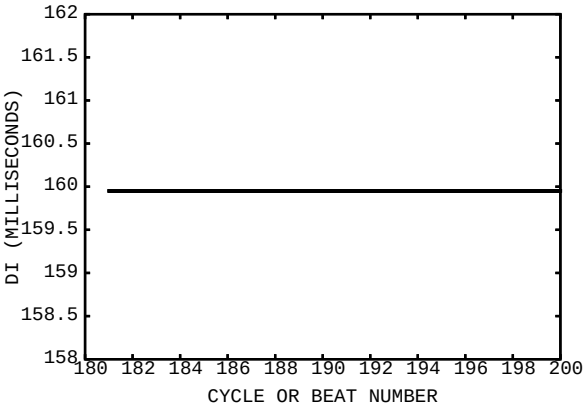


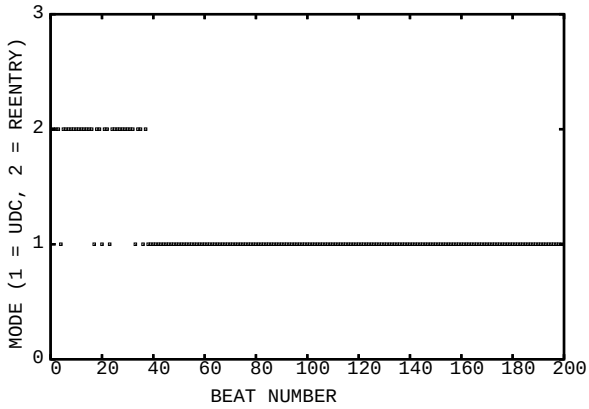
RUN 2: Same as Run 1 but with $\delta_2 = 90$. Occasional interruptions of reentry due to failure of T3. $DI_0 = 100$.



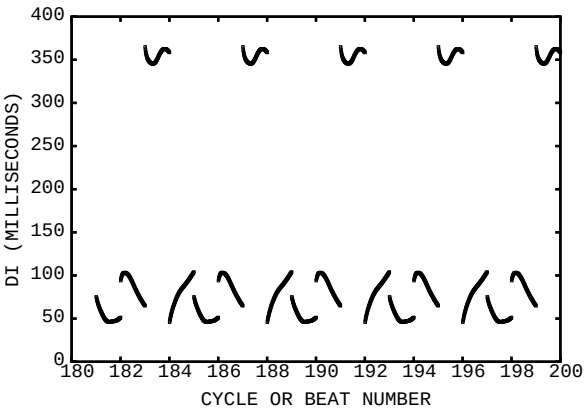


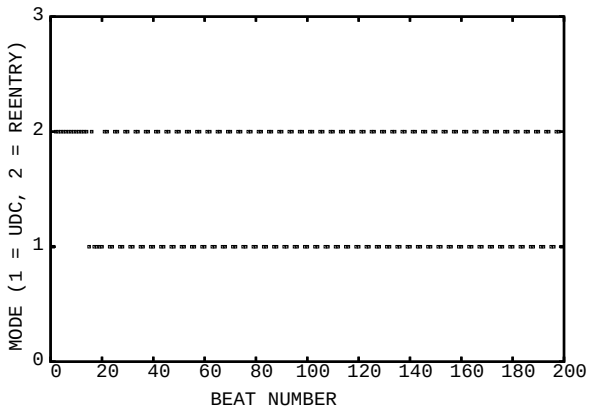
RUN 3: Same as Run 1 but with $\delta_2 = 50$. Reentry terminated in Beat 38, locking into UDC mode. $DI_0 = 100$. Steady-state DI value is 159.951.



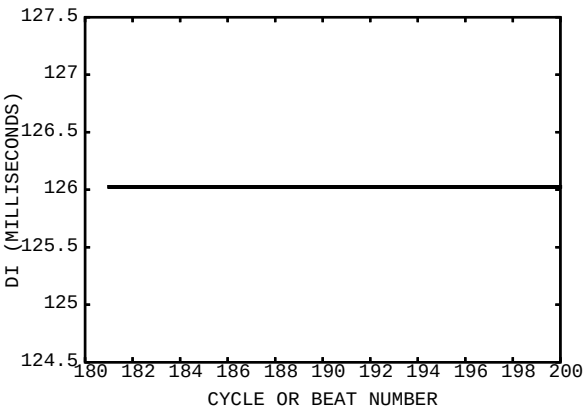


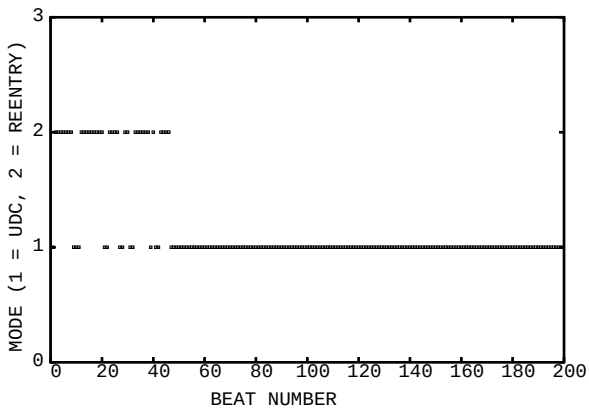
RUN 4: Same as Run 1 but with $\sigma = 0.0028$. Eventual pattern of 2 reentrant beats followed by 2 UDC beats. $DI_0 = 100$.



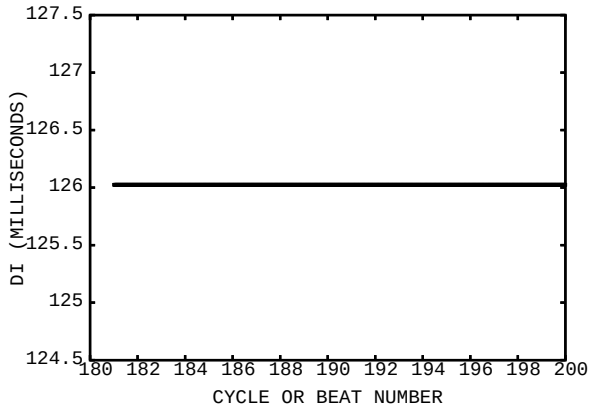


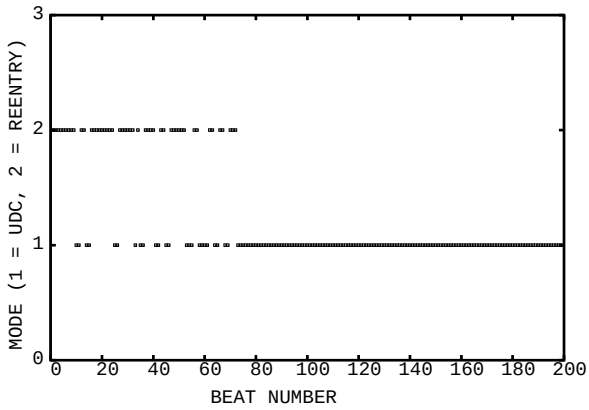
RUN 5a: Same as Run 1 but with $\sigma = 0.003$. Reentry terminated in Beat 46, locking into UDC mode. This is with $DI_0 = 100$.



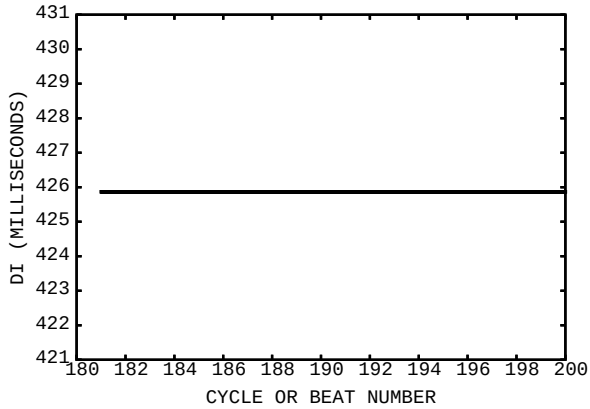


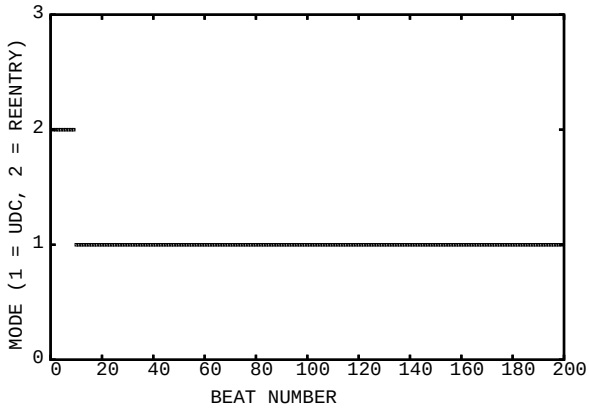
RUN 5b: Same as Run 5a but with $DI_0 = 60$.



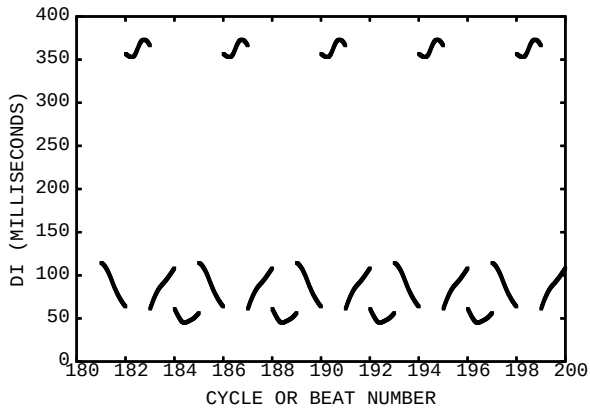


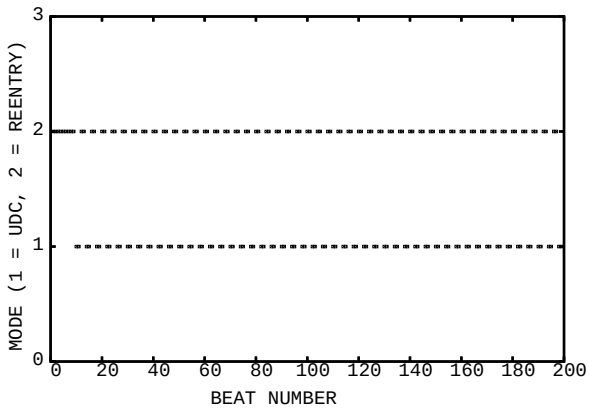
RUN 6: Same as Run 5b but with $B_n = 800$.



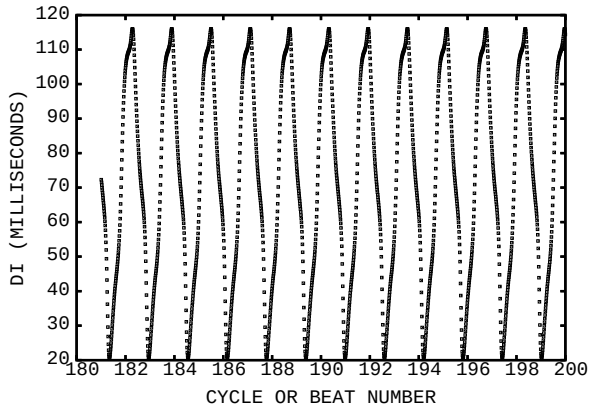


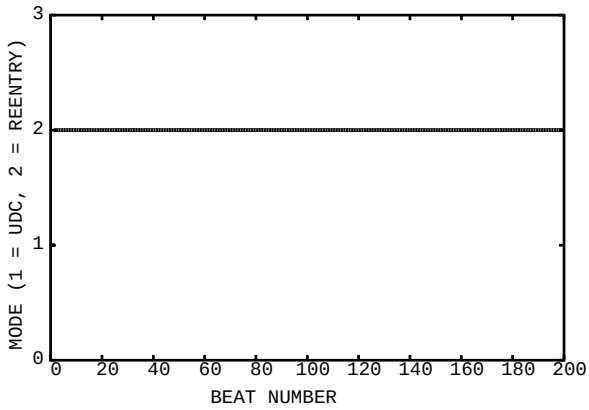
RUN 7: Same as Run 5b but with $a = 412$ and $b = 227$.



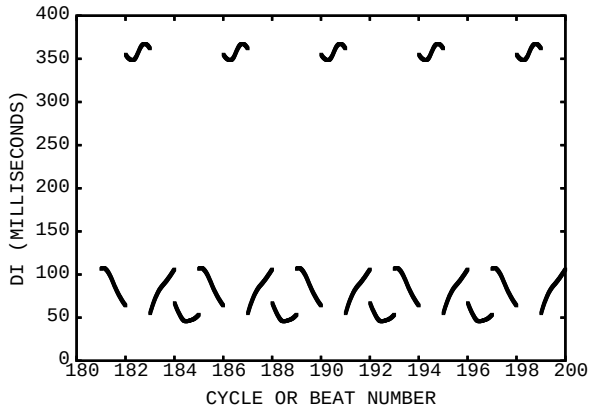


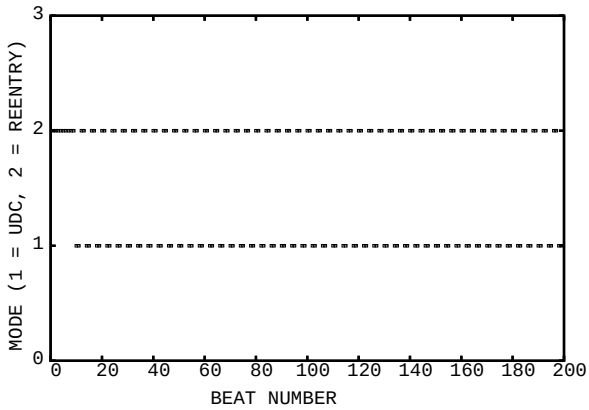
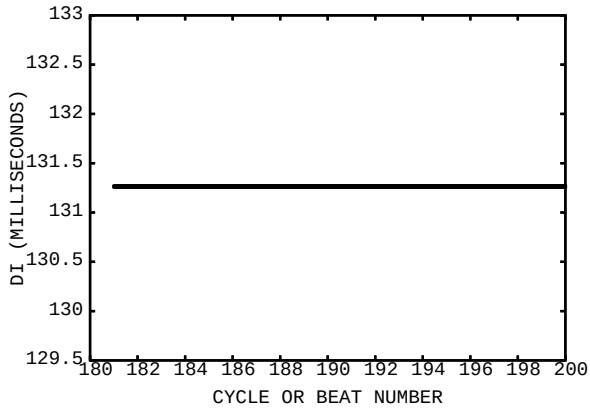
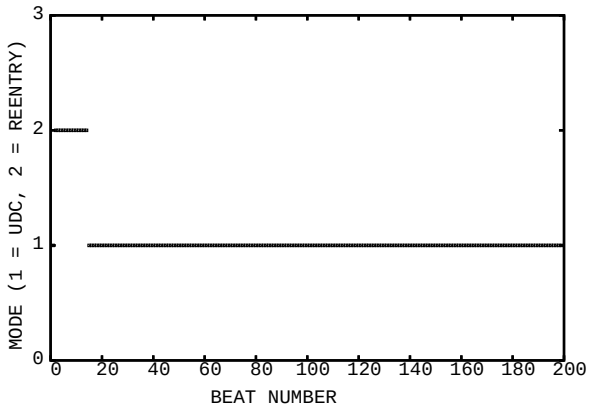
RUN 8: Same as Run 7 but with $DI_0 = 100$.





RUN 9a: Same as Run 7 but with $a = 422$ and $b = 237$.





RUN 9b: Same as Run 9a but with $DI_0 = 100$.