Alternans Suppression With Alternating Period Stimulation Scheme

Shiuan-Ni Liang [1] and Pik-Yin Lai [2]

[1] *School of Engineering, Monash University, 47500 Bandar Sunway, Malaysia*

[2] *Department of Physics, National Central University, Chung-Li, Taiwan 320, Republic of China*

lianxn@hotmail.com

Cardiac alternans, which is a condition involving alternate-beat variations in the action potential duration (APD) and the intracellular calcium concentration [Ca], can be developed during rapid pacing. During APD alternans, the APDs oscillate in a long-short-long-short pattern, whereas the [Ca] exhibits a large-small-large-small pattern when [Ca] alternans occurs. An alternating period stimulation scheme is used to reduce the alternans. A single cardiac cell is simulated by using the Luo-Rudy model. It is found that the mean of the average-[Ca] is increased after the alternans has been suppressed. This implies that the average contraction strength of the heart can be improved after the alternans has been reduced. The presentation will also discuss the dynamics of the cardiac system after the alternans is suppressed.