Abstract Submitted for the MAR10 Meeting of The American Physical Society

Noise Reductions in Coupled Genetic Oscillatory Systems BYUNGJOON MIN, KWANG-IL GOH, IN-MOOK KIM, Department of Physics, Korea University, Seoul 136-713, Korea — The negative feedback is well known to form the core of the genetic oscillatory systems. Although a negative feedback loop alone, such as the Repressilator, can produce sustained oscillations of protein concentrations, it is too noisier to ensure the robust oscillatory function, especially in the amplitudes manner. In addition, real genetic regulation circuits are formed a complex network constructed many coupled feedback structures. Here, we study dynamics of the coupled genetic oscillatory systems using exact stochastic simulation to extract simple rules for noise reduction in the oscillatory activities. we found the specific coupled structures reduce noise in the oscillations and the dynamics at the operator site is a key role for the noise in the oscillations.

Byungjoon Min Department of Physics, Korea University, Seoul 136-713, Korea

Date submitted: 20 Nov 2009

Electronic form version 1.4