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Liming Wang* (limingwang.math@gmail.com), 5151 State University Dr., Los Angeles, CA 90032, and **Jack Xin** and **Qing Nie**. *A critical quantity for noise attenuation in feedback systems.*

Feedback modules, which appear ubiquitously in biological regulations, are often subject to disturbances from the input, leading to fluctuations in the output. What are the functions of feedback loops? Why are there often multiple feedback loops in biological systems? Do they affect a system's noise property? In this talk, we will explore these questions by introducing a critical quantity: SAT (the signed activation time) that dictates the noise attenuation capability in feedback systems. Our findings suggest that the inverse relationship between the noise amplification rate and the signed activation time could be a general principle for many biological systems regardless of specific regulations or feedback loops. (Received February 04, 2013)