

Abstract Submitted  
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**Stabilizing Motifs in Autonomous Boolean Networks and the Yeast Cell Cycle Oscillator**<sup>1</sup> VOLKAN SEVIM, XINWEI GONG, JOSHUA SOCOLAR, Physics Department, Center for Nonlinear and Complex Systems, and IGSP Center for Systems Biology, Duke University, Durham, North Carolina 27708, USA — Synchronously updated Boolean networks are widely used to model gene regulation. Some properties of these model networks are known to be artifacts of the clocking in the update scheme. Autonomous updating is a less artificial scheme that allows one to introduce small timing perturbations and study stability of the attractors. We argue that the stabilization of a limit cycle in an autonomous Boolean network requires a combination of motifs such as feed-forward loops and auto-repressive links that can correct small fluctuations in the timing of switching events. A recently published model of the transcriptional cell-cycle oscillator in yeast contains the motifs necessary for stability under autonomous updating [1].

[1] D. A. Orlando, et al. *Nature (London)*, 453(7197):944–947, 2008.

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Volkan Sevim  
Physics Dept., Center for Nonlinear and Complex Systems, and  
IGSP Center for Systems Biology, Duke University,  
Durham, North Carolina 27708, USA

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