

## New Bottom-up Construction Strategy of Biomolecular Circuits Based on Dynamic Robustness Measure

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We analyze the biomolecular switchable memory system created by a bottom-up construction strategy [1] to reveal the reason to the successful synthesis. The system is represented by a feedback form. Utilizing the robust bifurcation analysis method for feedback systems [2], which evaluates the robustness against both of dynamic and parametric perturbations, we can guarantee the validity of the bottom-up construction. Lastly, we propose a novel construction strategy for system-level biomolecular circuits by assembling core modules with high dynamic robustness.

[1] Padirac A., Fujii T., and Rondelez Y., *Proceedings of the National Academy of Sciences*, 109:E3212-E3220, 2012.

[2] Inoue M., Imura J.-I., Kashima K., Aihara K., *International Journal of Bifurcation and Chaos*, 23, 2013 (in press).