Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Live cell FLIP: anomalous protein diffusion and its fluctuation MINGHAO GUO, MARTIN GRUEBELE, University of Illinois at Urbana - Champaign — Macromolecular crowding in the cell modulates protein structure and stability, as well as protein diffusion and transportation in cytoplasm. This crowded environment limits the protein diffusion in a confined space and gives rise to anomalous subdiffusion at long time and distance scales. The anomalous diffusion in living cells have been sufficiently studied with fluorescence recovery after photobleaching (FRAP). However, this method focuses on local diffusion, giving too little information about the global cellular environment. Fluorescence loss in photobleaching (FLIP), though giving up details about short distance behavior, provides a better view on the larger scale of anomalous diffusion. We use this powerful tool combined with numerical simulation to study the temperature and protein conformation dependence of diffusion in living cells. We compared the different anomalous behaviors of protein diffusion between cells. The fluctuation of diffusion in cellular microenvironment is also studied.

Minghao Guo
University of Illinois at Urbana - Champaign

Date submitted: 15 Nov 2013 Electronic form version 1.4