MAR11-2010-004544

Abstract for an Invited Paper
for the MAR11 Meeting of
the American Physical Society

Consistency and discrepancy between single molecule force spectroscopy experiments and theoretical models

ROBERT ROS, Department of Physics, Arizona State University, Tempe, AZ 85287-1504

Single molecule force spectroscopy is a well-established tool to study molecular interactions in a wide range of binding affinities on the single-molecule level. Information about the strength of the molecular bond can be quantified in terms of the dissociation rate k_{off}, and the reaction length x_b (i.e., the distance between potential minimum and maximum along the direction of pulling). The analysis and interpretation of the underlying force-distance curves is still challenging and various models describing the experimental data are under discussion. In this talk, I will present experimental data for a protein-RNA interaction related to posttranscriptional regulation on the single molecule level, and the interaction between DNA bases forming two or three hydrogen bonds. I will use these examples to discuss the advantages and limitations of this technique, and the consistency and discrepancy to theoretical models.