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Visualizing charge injection in a DNA molecule and DNA-protein complexes with scanning probe microscopy NAM-JOO LEE, Dept. of Physics, Myongji University, Yongin, Gyeonggi-Do 449-728, Korea, KYUNG AH YOO, Dept. of Electrical Eng., Myongji University, Yongin, Gyeonggi-Do 449-728, Korea, JAE WOO YOO, Dept. of Physics, Myongji University, Yongin, Gyeonggi-Do 449-728, Korea, YONG SANG KIM, Dept. of Physics, Myongji University, Yongin, Gyeonggi-Do 449-728, Korea, CHI JUNG KANG, Dept. of Physics, Myongji University, Yongin, Gyeonggi-Do 449-728, Korea — Scanning probe microscopy (SPM) with a conducting tip is performed on single-, double-stranded DNA molecules and on DNA-protein complexes. The applied bias voltage dependence of each molecule on a silicon substrate was monitored first to clarify the DNA-substrate interaction and to subtract the background effects in our experiment. After charge injection from the tip to the sample through the voltage stress to a local area of DNA molecule, apparent height difference was measured and compared with that before stressed one. Similar experiments were done with different bias polarities and with sequential stress steps. Injection efficiency with respect to the conformational change of DNA molecules was also monitored. The physical and electrical properties of the DNA-protein complexes were measured by local probing around the protein-DNA binding sites using SPM.

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