

Abstract Submitted
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Modified Electric Force Microscopy combined with Atomic Force Microscopy Electrostatic Nanolithography SERGEI LYUKSYUTOV, The University of Akron — A hybrid method, combining electrostatic nanolithography with modified electric force microscopy was used to characterize and study surface electric charging of high molecular weight (850000 mw and 110000 mw) polymethyl methacrylate and polystyrene films. Experimental protocol to manipulate an atomic force microscope tip included 1) Displacement of the vibrating tip to the level when the vibration amplitude largely damped; 2) Tip retraction at the distance varied between 1 to 100 nm with positive or negative tip bias. A modified Electric force microscopy maps electric charge distribution and its sign on the sample surfaces. Stable surface deformation related to nanoscale mass transport was associated with electric breakdown and negative surface charging, while a temporary viscoelastic surface deformation followed by surface relaxation was due to positive surface charging.

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