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Instabilities of charged liquid jet of polymer solution and electrospinning of Nanofibers.[1] KHALED SALLAM, ANU OSTA, Oklahoma State University, ABDEL-RAHMAN EL-LEATHY, Helwan University, Egypt — An experimental study of the mechanism of beads formation during electro-spinning of nanofibers is presented. Liquid jets of a polymer solution (Poly Ethylene Oxide (PEO)) were electrospun and the resulting PEO nanofibers were deposited on a grounded substrate. The collected nanofibers exhibited bead-like structures depending on: the polymer concentration in the electro spun solution, the applied voltage, the injection pressure and the needle-electrode distance. The micro jet near the nozzle exit was observed in-flight using digital holographic microscopy and the collected nanofibers were examined using Scanning Electron Microscopy (SEM). The measurements include initial liquid jet diameter and the wave lengths of the jet instabilities. The present results show a strong relationship between the initial jet instability (near the injector exit) and the bead formation on the collected nanofibers.

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