

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Orthogonal Double View Digital Holographic Diagnostics for Random Motion of Micro Polymer Jet by Electrospinning JAIHO LEE, KHALED SALLAM, Oklahoma State University — An experimental investigation of three-dimensional random behavior of polymer micro jet generated by electrospinning is described. Two frequency doubled Nd:YAG lasers were used as the light source and a commercial grade CCD sensor (Nikon D-70) was used for holograms recording. The two lasers could be fired with a pulse separation as small as 100 ns, and the two laser beams were aligned with three polarized beam splitter cubes. Orthogonal double-view and double-pulses were recorded on the same camera frame. The camera frame was split into two, and both of the halves of the frame were used for each view. Two objective lenses (M 5x) and two spatial filters (Pinhole $\sim 5\mu\text{m}$) were used to generate expanding laser beams in the digital microscopic holography (DMH) optical setup. As the electric field (~ 20 kV) was intensified, the polymer solution formed a charged filament (or multiple filaments) from the tip of the Taylor cone. As the filament was accelerated toward the collector, its diameter was shrunk and axisymmetric disturbances grew further away from the exit. The polymer was randomly deposited on the collector as non woven microfiber.

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Date submitted: 05 Aug 2008

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