NWS11-2011-000059

Abstract for an Invited Paper
for the NWS11 Meeting of
the American Physical Society

Probing Chromosome Structure and Dynamics: The Physics of a Long Tangledd Polymer?

PAUL WIGGENS, University of Washington

The stochasticity of chromosome organization, dynamices, and micro-structure are investigated in live cells. The E. coli chromosome is precisely organized into a nucleoid filament with a linear order. Loci in the body of the nucleoid show a precision of inter-locus distance of genomically-proximate loci was better than 4% of the cell length. The measured dependence of the precision of inter-locus distance on genomic distance singles out intra -nucleoid interactions as the mechanism responsible for chromosome organization. We probe the nature of this structure using super-resolution fluorescence microscopy and investigate the processivity of segregation of newly replicated genetic loci and their condensation into the nucleoid.