

Abstract Submitted  
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**Photon-by-Photon Determination of Emission Bursts from Diffusing Single Chromophores** KAI ZHANG, HAW YANG, University of California at Berkeley — Diffusing-type single molecule experiment is expected to provide rich information such as protein conformational distribution, DNA sequencing, ultra-sensitive detection, to name a few. However, its application is greatly limited by the difficulty of extracting the useful information out of the noisy data because of the embedded Poissonian noise. Conventional analysis of such trajectories involves further smoothing the data followed by artificially setting a threshold to distinguish the signal, risking the chance of ignoring the fast transition events along the trajectory. Here we report a statistically robust algorithm, which operates on the trajectory photon by photon, based on the well established sequential test model. A demonstration experiment with the gold nanoparticle diffusing through the detection volume shows that our algorithm indeed retrieves more information, relieving the uncertainty of artificial placement of bin width and threshold.

Kai Zhang  
University of California at Berkeley

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