

AUTOCORRELATION ANALYSIS OF DNA-PAINT SUPER RESOLUTION MICROSCOPY DATA

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ABSTRACT: We present a novel autocorrelation analysis of DNA-PAINT super resolution microscopy data [1] to quantify the binding dynamics of DNA hybridization. Common approaches [2] in the field of super-resolution microscopy quantify binding dynamics based on the assumption of sparse events. Although this condition has to be fulfilled for sub-diffraction localization it intrinsically limits the statistical description of the process due to low numbers of detected binding events.

Our approach processes localization files obtained by the Picasso software package [3] which offer potential sub-diffraction localization and filtering capabilities while still being able to get an accurate description of the binding dynamics and target molecule counts for dense signals [4]. It therefore closes the gap between working with sparse signals, in cases where optimal spatial resolution is needed, and working with dense signals in cases where a description of the binding dynamics or the counting of molecules in unresolvable areas is of importance.

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