Origin and compensation of imaging artefacts in localization-based super-resolution microscopy

Miklós **Erdélyi**[1], József Sinkó[1], Eric Rees[2], Dániel Varga[1], Tamás Gajdos[1] and G. Szabó[1]

[1]*University of Szeged, Hungary,* [2]*University of Cambridge, UK*

Interpretation of super-resolved images provided by localization-based microscopy techniques is a challenge due to imaging artefacts introduced by the optical system, the studied sample or by the applied algorithms. Some artefacts can be eliminated via precise calibration procedures, others cannot be reduced below a certain value owing to principle physical laws. Experimental optimization of imaging parameters is time-consuming and expensive. TestSTORM code developed by the AdOptIm research group is a simulator that can be used to optimize these steps. TestSTORM users can select from among four different structures with specific patterns, dye and acquisition parameters. Moreover, image stacks can be generated for further evaluation using localization algorithms, offering a tool for further software developments.

M. Erdélyi, J. Sinkó, R. Kákonyi, A. Kelemen, E. Rees, D. Varga and G. Szabó, Origin and compensation of imaging artefacts in localization-based super-resolution microscopy,
Methods, 88, 122-132, DOI: 10.1016/j.ymeth.2015.05.025 (2015).

József Sinkó, Róbert Kákonyi, Eric Rees, Daniel Metcalf, Alex E. Knight, Clemens F. Kaminski, Gábor Szabó, and **Miklós Erdélyi**: TestSTORM: Simulator for optimizing sample labeling and image acquisition in localization based super-resolution microscopy
Biomedical Optics Express, 5(3), 778-787 2014.

Figure 1. 2D STORM super-resolved image of F-actin (A) and its cross section (B).

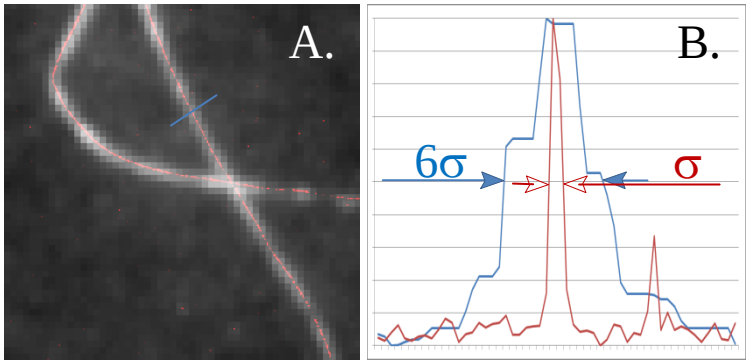

Figure 2. Simulated super-resolved dSTORM images using different imaging parameters.