

# COMPARISON OF ALGORITHMS FOR LOCALIZATION OF SINGLE FLUORESCENCE MOLECULE IN SUPER RESOLUTION IMAGING

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Localization of single fluorescent molecule is required in a number of super resolution imaging techniques. From the point of view of super resolution imaging, a rigorous comparison of the performance of the different algorithms under experimental conditions is necessary. In this paper, five commonly used localization algorithms: Centroid method, Generalized centroid method, Gaussian fitting, FluoroBancroft method, and Maximum likelihood method were investigated, and how well these algorithms work was clarified. The results are as followings: firstly, Gaussian fitting and Maximum likelihood method are high localization precision method and have been slightly influenced by extracting sub-window. Secondly, Centroid method and FluoroBancroft method could be applied in on-time imaging, however, they have been low localization precision and influenced by extracting sub-window, Generalized centroid method as a fast algorithm, eliminating the impact of extracting sub window, still keep lower localization precision than Gaussian fitting and Maximum likelihood method. Thirdly, for the five discussed algorithms, the localization precision is abruptly decreased when there are two molecules in a diffraction spot.