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Kappa-squared: from nuisance to new sense

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Abstract

The orientation factor, which is commonly called kappa-squared, is often considered to be a nuisance because it represents a significant uncertainty in the distance obtained with the FRET technique. It is shown that this uncertainty is rather small in almost all cases of practical interest if one takes the width of a 67% confidence interval (CI) for the distance distribution as a measure of uncertainty. Kappa-squared has the potential to open up new information on orientations and rotations from time-resolved studies of donor and acceptor anisotropies. One can make sense of such data by designing matrix models for the transitions between states describing various orientations and positions of donors and acceptors in the system. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Orientation factor; Fluorescence depolarization; Distance distribution; Averaging regimes; Uncertainty in the distance; Most probable distance