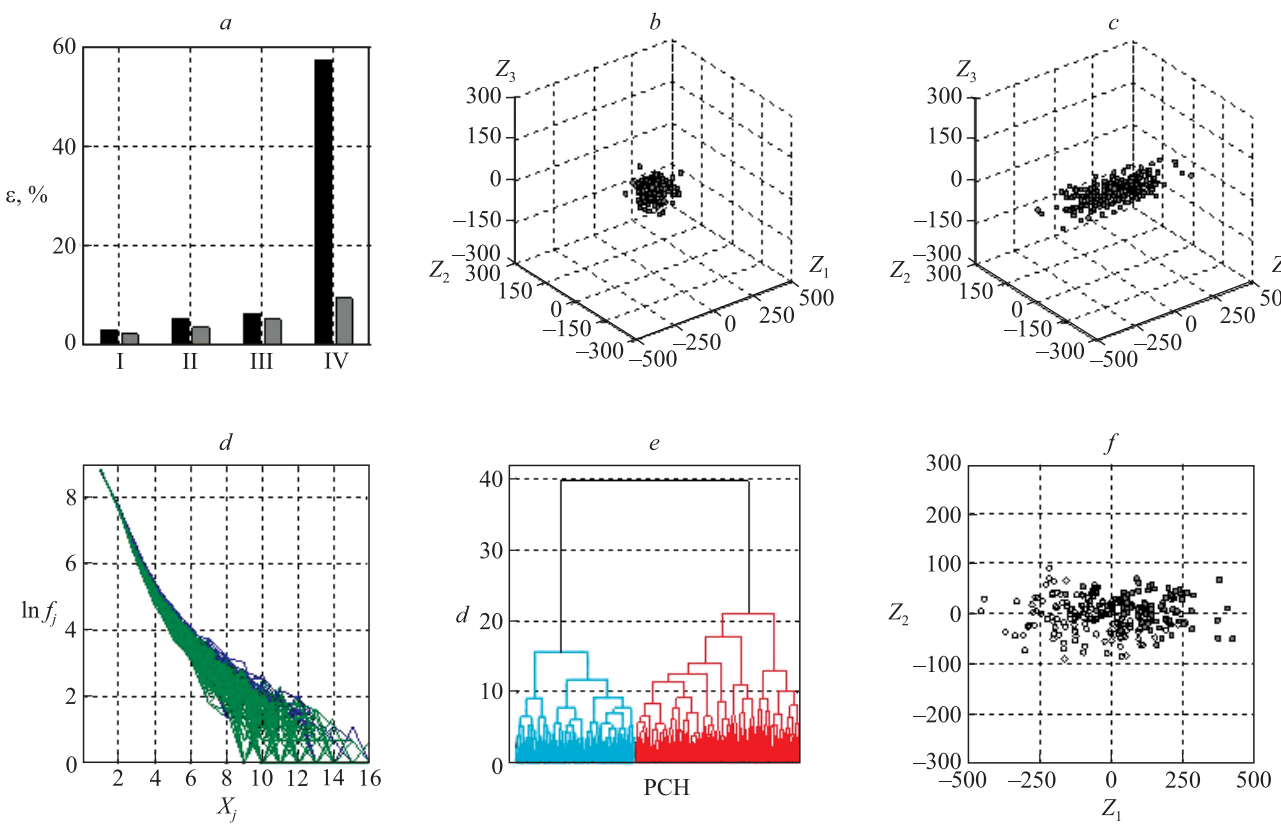

Fig. 6. Examples of the application of an integrated approach to the analysis of molecular compounds in experiments with time-resolved fluorescence (*a*) and fluorescence fluctuation (*b*–*f*) spectroscopies: (*a*) error ε in assessing the accuracy of reconstructing the parameters of simulated fluorescence decay curves of fluorophore systems characterised by one-exponential (I and II), two-exponential (III) and stretched-exponential (IV) laws of fluorescence decay, using classical (black) and developed (gray) methods. Digital labels (I–IV) of the abscissa axis denote the following modelling parameters: fluorescence decay times $\tau_1 = 2$ ns and $\tau_2 = 4$ ns, number of curves is 200, standard deviation of parameters $\sigma = 0.1$ (I); $\tau_1 = 1.4$ ns and $\tau_2 = 2$ ns, number of curves is 200, $\sigma = 0.1$ (II); $\tau_1 = 0.5$ ns and $\tau_2 = 2$ ns, their contributions (normalised to one) $p_1 = 0.2$, $p_2 = 0.8$ and $p_1 = 0.8$, $p_2 = 0.2$, respectively, for two sets of decay curves, number of curves is 200, $\sigma = 0.1$ (III); donor fluorescence decay time $\tau_D = 2$ ns, acceptor concentration q is equal 1 and 0.2 for two sets of decay curves, number of curves is 200, $\sigma = 0.1$ (IV); (*b*) and (*c*) are photon counting histograms PCHs of monomeric and dimeric forms of the green fluorescent protein GFP in the coordinates of the most informative components Z_1, Z_2 and Z_3, calculated by the principal component method; (*d*) PCH on a logarithmic scale in the space of the initial features X_1, X_2, …, X_{16}, f_j are frequencies of occurrence of the number of photons during a certain short time interval; (*e*) dendrograms of PCH, *d* is a measure of similarity of clusters; (*f*) PCH in the space of the first two principal components Z_1 and Z_2. In illustrations *d*–*f* colours and symbols indicate monomeric and dimeric forms of proteins