Review of: "Correlating exciton coherence length, localization, and its optical lineshape"

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In the article author try to explain the complicated thing by the simple models. The Frenkel exciton (eq. 2) or shifted harmonic oscillator (eq. 13) are rather clear models, and this fact is both positive and negative. It makes one able to write analytical formulae and the author do that. It seems to be absolutely correct.

However the simple equation are good for the fitting of the experimental data but are bad for the predictions. For example, if you would try to perform the ab-initio calculations of the parameters of eq. 2 you will find much more excited states of the single monomer and your exciton Hamiltonian will be much larger then eq.13. It seems for me to true for any organic dye. The same can be with the harmonic phonon-phonon model which can for the real system be effected by the electron-phonon coupling of become anharmonic.

In this situation I'd like to ask

1) for what systems the author are going to use there models?

2) are there any proofs of the applicability of this simple models?

3) “for typical conjugated polymer systems, $S \approx 1$ and $\hbar\Omega \approx 200 meV$” - where this estimates are taken from and are this data reliable?

Finally, I'd like to wish good luck to everyone who wants to use any simple model and to wish patience to every one who found that they don't work