

Erratum: Optical absorption and luminescence of α -LiV₂O₅ from the Bethe-Salpeter equation **[Phys. Rev. B **112**, 035132 (2025)]**

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In Figs. 3 and 4 of Ref. [1] we reported an unusually strong anisotropy between the a and b polarizations, with a particularly strong exciton absorption for $\mathbf{E} \parallel \mathbf{a}$ of order 100 in the value of $\epsilon_2(\omega)$. It turns out that this results from an overestimate of the velocity matrix elements when using an inaccurate $d\Sigma/dk$ to evaluate the contribution from the self-energy to the commutator $[\mathbf{r}, \Sigma(\mathbf{r}, \mathbf{r}')] [2,3]$. When we instead use the approximate scaling relation of the matrix elements by $(\epsilon_{\mathbf{c}\mathbf{k}}^{\text{QP}} - \epsilon_{\mathbf{v}\mathbf{k}}^{\text{QP}})/(\epsilon_{\mathbf{c}\mathbf{k}}^{\text{LDA}} - \epsilon_{\mathbf{v}\mathbf{k}}^{\text{LDA}}) [4]$, this strong overestimate is removed. The values of $\epsilon_2(\omega)$ are then of the same order of magnitude as in pure V₂O₅. In fact, the rescaling approach had been used for the V₂O₅ spectra in Fig. 3. We here present corrected Figs. 1 and 2 using the rescaling approach for both the antiferromagnetic (AFM) and ferromagnetic (FM) cases. Correspondingly, the real part of $\mathbf{E} \parallel \mathbf{a}$ is then only 4.40 in the BSE, 3.88 in IPA, while for $\mathbf{E} \parallel \mathbf{b}$ it is 3.85 in BSE and 3.33 in IPA. These values correct the values given in the main paper in the last paragraph of Sec. III.

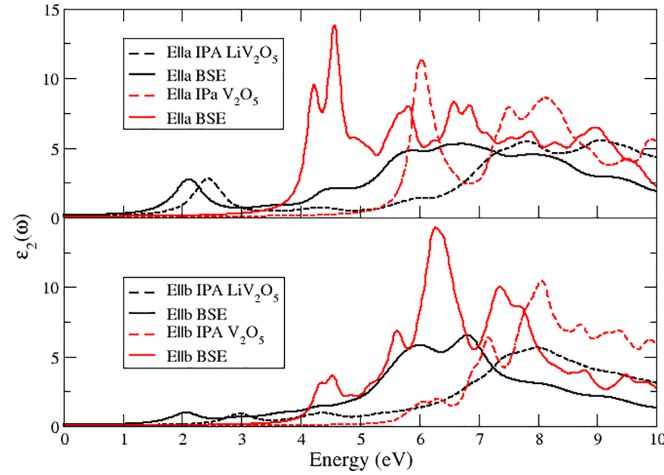


FIG. 1. Comparison between AFM LiV₂O₅ and V₂O₅ imaginary part of the dielectric function. This figure replaces Fig. 3 of the original paper.

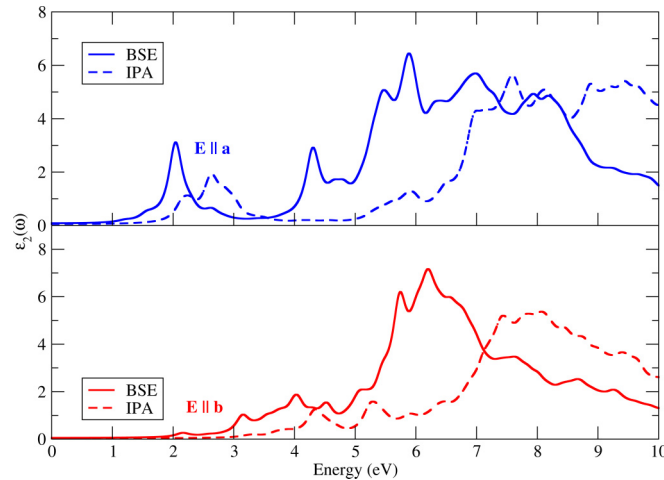


FIG. 2. Imaginary part of dielectric function for FM LiV₂O₅. This figure replaces Fig. 4 of the original paper.

These corrections to the magnitude of the absorption do not invalidate the main conclusions of the paper that this excitonic absorption near 2 eV coincides with the luminescence emission from self-trapped electron polarons recombining with holes at the valence-band maximum and therefore can be responsible for the reduction in cathodoluminescence upon Li intercalation.

DATA AVAILABILITY

The data that support the findings of this article are openly available [5]; embargo periods may apply.

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 - [4] Z. H. Levine and D. C. Allan, Linear optical response in silicon and germanium including self-energy effects, *Phys. Rev. Lett.* **63**, 1719 (1989).
 - [5] The data used in Figs. 1 and 2 are available at https://github.com/Electronic-Structure-Group/LiV2O5_Optics.