AUTHOR CORRECTION

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Author Correction: Discrete interactions between a few interlayer excitons trapped at a MoSe₂–WSe₂ heterointerface

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npj 2D Materials and Applications (2021)5:80; <https://doi.org/10.1038/s41699-021-00256-7>

Correction to: npj 2D Materials and Applications <https://doi.org/10.1038/s41699-020-0141-3>, published online 12 May 2020

The authors became aware of a numeric error in a parameter they used (dipolar interactions) in the model to interpret their experimental findings. As a result of this error, the following changes have been made to the original version of this Article:

In “Modelling interactions in multi-exciton complexes” under “Results and discussion”, the forth sentence of the first paragraph originally stated “For values of $\ell \sim 3\text{--}4\text{ nm}$, reference to Fig. 3a shows that $\Delta\rho \sim 5\text{--}6.5\text{ nm}$.” In the corrected version “ $\Delta\rho \sim 5\text{--}6.5\text{ nm}$ ” is replaced by “ $\Delta\rho \sim 4.5\text{--}5.5\text{ nm}$ ”.

The forth sentence after Equation (5) originally read “The experimentally observed blueshift of LIX₂ of $(8.4 \pm 0.6)\text{ meV}$ is consistent with a confinement lengthscale in the range $\ell = 2.8\text{--}3.3\text{ nm}$ ”. In the corrected version “ $\ell = 2.8\text{--}3.3\text{ nm}$ ” is replaced by “ $\ell = 2.5\text{--}3.0\text{ nm}$ ”.

The eighth sentence after Equation (5) originally read “Remarkably, ... for a dielectric constant in the range $\epsilon \gtrsim 3$, ... and an effective confinement lengthscale of $\ell \approx 3\text{ nm}$.” In the corrected version “ $\epsilon \gtrsim 3$ ” is replaced by “ $\epsilon \approx 3$ ” and “ $\ell \approx 3\text{ nm}$ ” is replaced by “ $\ell \lesssim 3\text{ nm}$ ”.

The correct version of Fig. 3 is shown below after correcting the dipolar repulsion and exchange splitting energy (~20% differences).

This has now been corrected in both the PDF and HTML versions of the Article.

Besides, “Supplementary Note 11: Calculations of the binding energy of the localized multi-IXs” of the Supplementary Information contained errors in the text and some Supplementary Equations because all dipolar interactions were counted twice.

The original Supplementary Equations (4–7) incorrectly read:

$$U^{2X} = 2 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{2} \right)^2 + 2 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} \quad (4)$$

$$U^{3X} = 3 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{\sqrt{3}} \right)^2 + 6 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} \quad (5)$$

$$U^{4X} = 4 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{\sqrt{2}} \right)^2 + 8 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} + 4 \frac{d^2}{4\pi\epsilon} (\sqrt{2}\Delta\rho)^{-3} \quad (6)$$

$$U^{5X} = 5 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\sqrt{50+10\sqrt{5}}\Delta\rho}{10} \right)^2 + 10 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} + 10 \frac{d^2}{4\pi\epsilon} \left(\frac{1}{2} (1+\sqrt{5})\Delta\rho \right)^{-3} \quad (7)$$

The correct form of Supplementary Equations (4–7) is:

$$U^{2X} = 2 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{2} \right)^2 + \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} \quad (4)$$

$$U^{3X} = 3 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{\sqrt{3}} \right)^2 + 3 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} \quad (5)$$

$$U^{4X} = 4 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\Delta\rho}{\sqrt{2}} \right)^2 + 4 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} + 2 \frac{d^2}{4\pi\epsilon} (\sqrt{2}\Delta\rho)^{-3} \quad (6)$$

$$U^{5X} = 5 \cdot \frac{1}{2} \frac{\hbar^2}{M\epsilon^4} \left(\frac{\sqrt{50+10\sqrt{5}}\Delta\rho}{10} \right)^2 + 5 \frac{d^2}{4\pi\epsilon} (\Delta\rho)^{-3} + 5 \frac{d^2}{4\pi\epsilon} \left(\frac{1}{2} (1+\sqrt{5})\Delta\rho \right)^{-3} \quad (7)$$

The original Supplementary Equations (8–11) incorrectly read:

$$U_0^{2X} = \frac{5}{12^{3/5}} \tilde{E} \approx 1.125\tilde{E} \quad (8)$$

$$U_0^{3X} = \frac{5 \cdot 18^{2/5}}{6} \tilde{E} \approx 2.648\tilde{E} \quad (9)$$

$$U_0^{4X} = \frac{5(8+\sqrt{2})^{2/5}}{2^{2/5}3^{3/5}} \tilde{E} \approx 4.806\tilde{E} \quad (10)$$

$$U_0^{5X} \approx 7.648\tilde{E} \quad (11)$$

The correct form of Supplementary Equations (8–11) is:

$$U_0^{2X} = \frac{5}{2 \cdot 6^{3/5}} \tilde{E} \approx 0.853\tilde{E} \quad (8)$$

$$U_0^{3X} = \frac{5 \cdot 9^{2/5}}{6} \tilde{E} \approx 2.007\tilde{E} \quad (9)$$

$$U_0^{4X} = \frac{5(8+\sqrt{2})^{2/5}}{2^{4/5}3^{3/5}} \tilde{E} \approx 3.642\tilde{E} \quad (10)$$

$$U_0^{5X} \approx 5.796\tilde{E} \quad (11)$$

The original Supplementary Equations (12–15) incorrectly read:

$$E^{2X \rightarrow 1X} \approx E^X + 1.125\tilde{E} \quad (12)$$

$$E^{3X \rightarrow 2X} \approx E^X + 1.523\tilde{E} \quad (13)$$

$$E^{4X \rightarrow 3X} \approx E^X + 2.158\tilde{E} \quad (14)$$

$$E^{5X \rightarrow 4X} \approx E^X + 2.842\tilde{E} \quad (15)$$

The correct form of Supplementary Equations (12–15) is:

$$E^{2X \rightarrow 1X} \approx E^X + 0.853\tilde{E} \quad (12)$$

$$E^{3X \rightarrow 2X} \approx E^X + 1.154\tilde{E} \quad (13)$$

$$E^{4X \rightarrow 3X} \approx E^X + 1.635\tilde{E} \quad (14)$$

$$E^{5X \rightarrow 4X} \approx E^X + 2.154\tilde{E} \quad (15)$$

The third sentence after Supplementary Equation (21) originally read “For example, arranging three excitons in a line would result in $U_{0,\text{line}}^{3X} \approx 3.496 \tilde{E} > U_0^{3X}$, a quadexciton with three excitons on a triangle and the fourth one in the center would give $U_{0,\text{triangle}}^{4X} \approx 5.493 \tilde{E} > U_0^{4X}$ and a quintexciton consisting of four excitons on a square surrounding the fifth in the trap center would have $U_{0,\text{square}}^{5X} \approx 7.845 \tilde{E} > U_0^{5X}$.” In the corrected version “3.496 $\tilde{E}$ ” is replaced by “2.650 $\tilde{E}$ ”, “5.493 $\tilde{E}$ ” is replaced by “4.163 $\tilde{E}$ ” and “7.845 $\tilde{E}$ ” is replaced by “5.945 $\tilde{E}$ ”.

The HTML has been updated to include a corrected version of the Supplementary Information.

ADDITIONAL INFORMATION

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1038/s41699-021-00256-7>.

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