Erratum: Kinetic theory of spin-polarized systems in electric and magnetic fields with spin-orbit coupling. I. Kinetic equation and anomalous Hall and spin-Hall effects **[Phys. Rev. B **92**, 245425 (2015)]**

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Some misprints in formulas occur which do not change the results:

(i) The last $\vec{G}^<$ in Eq. (58) should be the matrix Green function $\hat{\vec{G}}^<$.

(ii) After (59) $E = -\partial_R \Phi - \dot{A}$ without charge e .

(iii) Eq. (61) should read correctly

$$-i[-\vec{\sigma} \cdot \vec{\Sigma} \circ, \hat{\vec{G}}^<]_- \rightarrow -2\vec{\sigma} \cdot (\vec{\Sigma} \times \vec{\vec{G}}^<) + [(\dot{\vec{\Sigma}} + eE\partial_k \vec{\Sigma})\partial_\omega + \partial_k \vec{\Sigma} \partial_R + (e\partial_k \vec{\Sigma} \times \vec{B} - \partial_R \vec{\Sigma})\partial_k] \cdot (\vec{\sigma} \vec{G}^< + \vec{\vec{G}}^<). \quad (61)$$

Please note that the vector notations for $\partial_k, \partial_R, B, E$ are suppressed in order to indicate that they form scalar products among each other and the vectors written explicitly among themselves, respectively.

(iv) The sentence after Eq. (150), “Since the last term in Eq. (149) vanishes due to symmetry in p we obtain exactly (134)”, is only true for linearized spin-orbit coupling. For graphene this term yields the intraband conductivity (to be published soon).

(v) In (153) the factor 2 in the nominator of the arctan should be 4 and the $\hbar$ s are corrected as

$$\begin{aligned} \sigma_{yx}^{\text{as}} &= \frac{e^2}{4\pi \hbar^2} \Sigma_n \tau_\omega \arctan \left[\frac{4\epsilon_\beta \tau_\omega \hbar}{\hbar^2 + 4(2\epsilon_\beta \epsilon_F + \Sigma_n^2) \tau_\omega^2} \right] \\ &\rightarrow \frac{e^2}{4\pi \hbar} \begin{cases} \frac{\epsilon_\beta \Sigma_n}{2\epsilon_\beta \epsilon_F + \Sigma_n^2} & \omega = 0, \tau \rightarrow \infty \\ \frac{\Sigma_n}{\hbar \omega} \operatorname{arctanh} \left[\frac{4\epsilon_\beta \hbar \omega}{\hbar^2 \omega^2 - 4(2\epsilon_\beta \epsilon_F + \Sigma_n^2)} \right] & \omega \neq 0, \tau \rightarrow \infty \end{cases}. \end{aligned} \quad (153)$$

(vi) In Eq. (155) the $\hbar$ s are corrected as

$$\begin{aligned} \sigma_{xx}^{\text{sym}} &= \frac{e^2}{16\pi \hbar} \left\{ \frac{4\epsilon_\beta \Sigma_n^2 \tau_\omega / \hbar}{2\epsilon_\beta \epsilon_F + \Sigma_n^2} + \left(1 - \frac{4\Sigma_n^2 \tau_\omega^2}{\hbar^2} \right) \arctan \left[\frac{4\epsilon_\beta \tau_\omega \hbar}{\hbar^2 + 4(2\epsilon_\beta \epsilon_F + \Sigma_n^2) \tau_\omega^2} \right] \right\} \\ &\rightarrow \frac{e^2}{4\pi \hbar} \begin{cases} 0 & \omega = 0, \tau \rightarrow \infty \\ \text{imaginary} & \omega \neq 0, \tau \rightarrow \infty \end{cases}. \end{aligned} \quad (155)$$

(vii) In Eq. (158) the nominator happens to appear in the denominator and should read correctly

$$\left. \begin{array}{l} \vec{\sigma}_{\alpha\beta}^{\text{as}} \\ \vec{\sigma}_{\alpha\beta}^{\text{sym}} \end{array} \right\} = \frac{e}{m_e \omega} \sum_p \frac{p_\alpha g}{1 - \frac{\omega^2}{4|\Sigma|^2}} \left\{ \begin{array}{l} \frac{i\omega}{2|\Sigma|} \vec{e} \times \partial_\beta \vec{e} \\ i \partial_\beta \vec{e} \end{array} \right. \quad (158)$$