

Errata to

Effectiveness of Artificial Neural Networks for Solving Inverse Problems in Magnetic Field-Based Localization

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There are errors in Equations (2) and (5) of [1]. The corrected versions of Equation (2) and (5) are respectively written as follows.

$$\begin{pmatrix} B_x(x, y, z, \theta^{(t)}, \varphi^{(t)}) \\ B_y(x, y, z, \theta^{(t)}, \varphi^{(t)}) \\ B_z(x, y, z, \theta^{(t)}, \varphi^{(t)}) \end{pmatrix} = \frac{\mu_0}{4\pi} \frac{m}{(x^2 + y^2 + z^2)^{5/2}} \times \left[\cos \theta^{(t)} \begin{pmatrix} 3xz \\ 3yz \\ 2z^2 - x^2 - y^2 \end{pmatrix} + \sin \theta^{(t)} \begin{pmatrix} 3xy \sin \varphi^{(t)} + (2x^2 - y^2 - z^2) \cos \varphi^{(t)} \\ 3xy \cos \varphi^{(t)} + (2y^2 - x^2 - z^2) \sin \varphi^{(t)} \\ 3z(x \cos \varphi^{(t)} + y \sin \varphi^{(t)}) \end{pmatrix} \right] \quad (2)$$

$$\begin{pmatrix} B_x^{(k)}(x^{(t)}, y^{(t)}, z^{(t)}, \theta^{(t)}, \varphi^{(t)}) \\ B_y^{(k)}(x^{(t)}, y^{(t)}, z^{(t)}, \theta^{(t)}, \varphi^{(t)}) \\ B_z^{(k)}(x^{(t)}, y^{(t)}, z^{(t)}, \theta^{(t)}, \varphi^{(t)}) \end{pmatrix} = \frac{\mu_0}{4\pi} \frac{m}{\{(x^{(k)} - x^{(t)})^2 + (y^{(k)} - y^{(t)})^2 + (z^{(k)} - z^{(t)})^2\}^{5/2}} \times \left[\cos \theta^{(t)} \begin{pmatrix} 3(x^{(k)} - x^{(t)})(z^{(k)} - z^{(t)}) \\ 3(y^{(k)} - y^{(t)})(z^{(k)} - z^{(t)}) \\ 2(z^{(k)} - z^{(t)})^2 - (x^{(k)} - x^{(t)})^2 - (y^{(k)} - y^{(t)})^2 \end{pmatrix} + \right. \quad (5) \\ \left. \sin \theta^{(t)} \begin{pmatrix} 3(x^{(k)} - x^{(t)})(y^{(k)} - y^{(t)}) \sin \varphi^{(t)} + \{2(x^{(k)} - x^{(t)})^2 - (y^{(k)} - y^{(t)})^2 - (z^{(k)} - z^{(t)})^2\} \cos \varphi^{(t)} \\ 3(x^{(k)} - x^{(t)})(y^{(k)} - y^{(t)}) \cos \varphi^{(t)} + \{2(y^{(k)} - y^{(t)})^2 - (x^{(k)} - x^{(t)})^2 - (z^{(k)} - z^{(t)})^2\} \sin \varphi^{(t)} \\ 3(z^{(k)} - z^{(t)}) \{(x^{(k)} - x^{(t)}) \cos \varphi^{(t)} + (y^{(k)} - y^{(t)}) \sin \varphi^{(t)}\} \end{pmatrix} \right]$$

Moreover, several images are wrongly located in Figure 5 of [1]. The corrected version of Figure 5 is depicted in the next page.

Reference

- [1] A. Sasaki, "Effectiveness of artificial neural networks for solving inverse problems in magnetic field-based localization," *Sensors*, vol. 22, no. 6, 2022, Art. no. 2240. <https://doi.org/10.3390/s22062240>

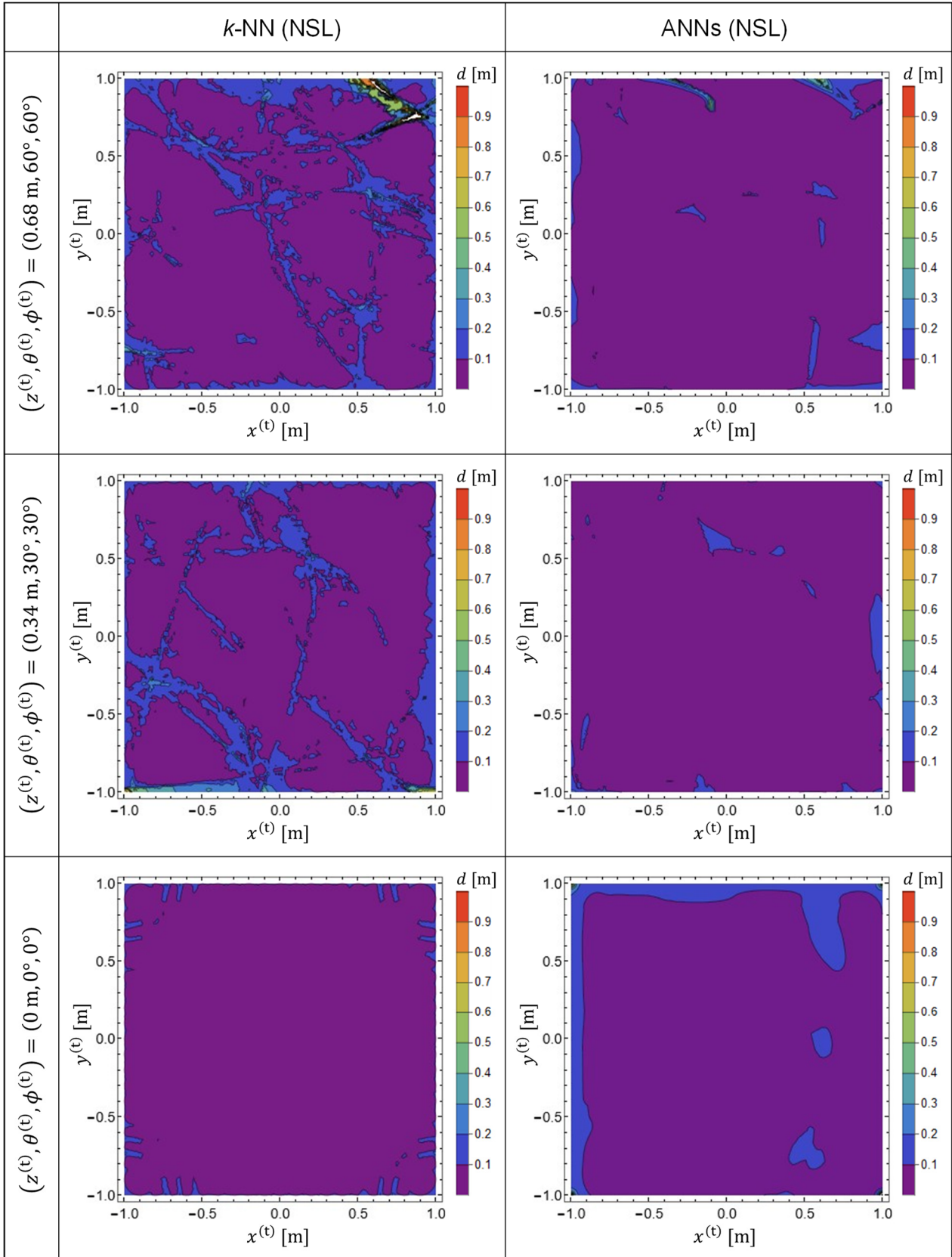


Figure 5. EDF patterns plotted in several cross sections parallel to the x - y plane. The left and right columns demonstrate results obtained with predictor functions generated by k -NN and ANNs, respectively. Both predictor functions (\mathbf{Q}) were generated from training data in NSL representation.