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ERRATUM

Erratum to: Local stable manifold theorem for fractional systems

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The statement given in Lemma 4, part 2 of the original article, namely "For $\beta > 0$,

$$E_{p,\beta}(t^p J_j) = t^{1-\beta} B_j(t) + C_j(t), \text{ hence } E_{p,\beta}(t^p A)_{n\times n} = t^{1-\beta} B(t) + C(t),"$$

is incorrect. The corrected version of the above expression is presented below. Note that Lemma 4 part 1 remains as it is.

For the corrected expression, we introduce the following notations. Notation: Let I_γ denote $n_j \times n_j$ matrix with entries $[I_\gamma]_{i,k} = \delta_{i+\gamma,k}$, $(\gamma = 0, \ldots, n_j - 1,\ 1 \leq i, k \leq n_j)$.

Lemma 4 **(Part 2 (Corrected))** *For* $0 < p < 1$, $j = 1, 2 \ldots, l$ *and* $q \in \mathbb{N}\backslash\{1\}$,

$$E_{p,p}(t^p J_j) = t^{-p}\widetilde{B_j(t)} + \widetilde{C_j(t)}, \tag{1}$$

where $\widetilde{B_j(t)}$ *and* $\widetilde{C_j(t)}$ *are* $n_j \times n_j$ *matrices defined as*

$$\widetilde{B_j(t)} := 0 \quad j = 1, 2, \ldots, s,$$
$$\widetilde{B_j(t)} := \widetilde{\Psi}_0(t, \lambda_j) I_0 + \widetilde{\Psi}_1(t, \lambda_j) I_1 + \cdots + \widetilde{\Psi}_{n_j-1}(t, \lambda_j) I_{n_j-1} \quad j = s+1, s+2, \ldots, l, \tag{2}$$
$$\widetilde{C_j(t)} := \widetilde{\Delta}_0(t, \lambda_j) I_0 + \widetilde{\Delta}_1(t, \lambda_j) I_1 + \cdots + \widetilde{\Delta}_{n_j-1}(t, \lambda_j) I_{n_j-1} \quad j = 1, 2, \ldots, l, \tag{3}$$

and

$$\widetilde{\psi_m}(t, \lambda_j) = \frac{1}{m!}\left[\frac{\partial^{m+1}}{\partial \lambda^{m+1}} \exp\left(t\lambda_j^{\frac{1}{p}}\right)\right], \quad m = 0, 1, 2, \ldots, n_j - 1. \tag{4}$$

$$\widetilde{\Delta_m}(t, \lambda_j) := \frac{1}{m!}\left(\sum_{k=2}^{q} \frac{(-1)^{m+2}(k+m)!}{(k-1)!} \frac{\lambda_j^{-k-m-1} t^{-pk}}{\Gamma(1-pk)} + O(|\lambda_j|^{-q-m} t^{-p-pq})\right). \tag{5}$$

Let $\widetilde{B(t)}$ *and* $\widetilde{C(t)}$ *denote the block diagonal matrices consisting of* $\widetilde{B_j(t)}$ *and* $\widetilde{C_j(t)}$ *on the diagonal, respectively. Hence* $E_{p,p}(t^p A) = t^{-p}\widetilde{B(t)} + \widetilde{C(t)}$.

As a consequence of the above correction, appropriate changes should be made in expressions of Lemma 5, 6, 8 and the step II of the proof of the theorem. Thus

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in view of these corrections the proof of the local stable manifold theorem given by us in the original article continues to hold true. For details we refer the readers to our article [1].

Reference

1. Deshpande, A., Daftardar-Gejji, V.: Local Stable Manifold theorem for fractional systems revisited. *ArXiv e-prints* (2017). http://adsabs.harvard.edu/abs/2017arXiv170100076D