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DOI: 10.1137/19M1241660

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CORRIGENDUM: Fenichel Theory for Multiple Time Scale Singular Perturbation Problems*

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Abstract. Hypothesis (H) on p. 1432 of P. T. Cardin and M. A. Teixeira, Fenichel Theory for Multiple Time Scale Singular Perturbation Problems [*SIAM J. Appl. Dyn. Syst.*, 16 (2017), pp. 1425–1452], is corrected.

Key words. Fenichel theory, singular perturbation, multiple time scales

AMS subject classifications. 34C20, 34D15, 34N05

DOI. 10.1137/19M1241660

On p. 1432 of [1], hypothesis (H) should have been written as follows:

(H) If $\mathcal{L}_1 \subset \mathcal{M}_1$ is a compact submanifold, we assume that the matrix $D_{x_1} f_1(\mathbf{x}_0, 0)$ has no eigenvalues with zero real part for all $\mathbf{x}_0 \in \mathcal{L}_1$. And for each $k = 2, \dots, n - 1$, if $\mathcal{L}_k \subset \mathcal{M}_k$ is a compact submanifold, we assume that the matrix $D_{x_k} \tilde{f}_k(\mathbf{x}_0, 0)$ has no eigenvalues with zero real part for all $\mathbf{x}_0 \in \mathcal{L}_k$, where \tilde{f}_k is the restriction of f_k to \mathcal{M}_{k-1} .

Despite the new wording, the results and their proofs are not affected. Moreover, the interpretation of this hypothesis remains unchanged, that is, the submanifold \mathcal{L}_k of \mathcal{M}_k , as a set of equilibria of the limiting problem (P_k) , is normally hyperbolic relative to (P_k) for $k = 1, \dots, n - 1$. Note that for $k = 2, \dots, n - 1$, the limiting problem (P_k) is defined on the manifold \mathcal{M}_{k-1} , so that we must consider the restriction \tilde{f}_k of f_k to \mathcal{M}_{k-1} (and not f_k properly) and assume that $D_{x_k} \tilde{f}_k(\mathbf{x}_0, 0)$ (instead of $D_{x_k} f_k(\mathbf{x}_0, 0)$) has no eigenvalues with zero real part.

Acknowledgment. The authors are grateful to Sebastian Walcher for pointing out the misunderstanding in the wording of hypothesis (H) in the paper [1].

REFERENCE

- [1] P. T. CARDIN AND M. A. TEIXEIRA, *Fenichel theory for multiple time scale singular perturbation problems*, *SIAM J. Appl. Dyn. Syst.*, 16 (2017), pp. 1425–1452.

*Received by the editors January 30, 2019; accepted for publication by M. Wechselberger February 28, 2019; published electronically June 27, 2019.

<http://www.siam.org/journals/siads/18-2/M124166.html>

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