

Differential Dynamical Systems — Errata (Second Printing)

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Errors are listed by page and line number. The symbol \implies means “replace with”. A negative line number means count from the bottom of the page. Each equation line is counted as one line.

Note that the first printing has 10 9 8 7 6 5 4 3 2 1 on the copyright page. The second printing was out in March 2009, and has 10 9 8 7 6 5 4 3 2 on the copyright page.

Ch.	Page	Line	Change	Thanks
1	8	2	as $t \rightarrow \infty \implies$ as t increases	
2	50	7	λ_k is an eigenvector $\implies \lambda_k$ is an eigenvalue	PM
	58	-4	delete “and $x_0 \in E^s$, the stable subspace of A	
	58	-1	Consequently, \implies for any $x_0 \in E^s$, the stable subspace of A. Consequently,	HLS
	63	-12	solutions (2.48) \implies solutions (2.49)	AR
	66	-6	$M^2 = e^{TR} \implies M^2 = e^{2TR}$	MS
	67	-5	$t \in R \implies t \in \mathbb{R}$	
	68	8	Replace (d) with: Finally argue that if $e^{tA}e^{tB} = e^{t(A+B)}$ then differentiation with respect to time implies that $F(t) = G(t)$. By differentiating again, finally show that $[A, B] = 0$.	
	3	76	-4	For a function \implies If a function
76		-3	the derivative at \implies is differentiable then the derivative at	TB
78		-2	normed space \implies metric space	TB
80		4	$f_j \in Y \in X \implies f_j \in Y \subset X$	
83		-14	to arbitrary compact sets. \implies to arbitrary compact sets using the following lemma.	
83		-13	Corollary 3.8 \implies Lemma 3.8	
92		16	on $J = [t_o - a, t_o + a] \implies$ on $J = [t_o - c, t_o + c]$	
92		-14	for $t \in J$ and $a = b/M \implies$ for $t \in [t - a, t + a]$ and $a = \min(c, b/M)$	TB
92		-6	before “This result” add the sentence: “Using Picard iteration or Theorem 3.18, the interval of existence can be extended to the entire interval J .”	TB
94		-3	$b \implies g$	TB
96		-5	Before “Consequently” add the sentence: “However since $u \in B_b(x_o)$ then, by the argument sketched in Exercise 2, f is uniformly C^1 on this compact set and we can assume that $\delta(\varepsilon)$ only.”	TB
96		4	$= \delta(\varepsilon, b) \implies = \delta(\varepsilon)$	
99		7	$B_b(x_o) \implies B_{b_o}(x_o)$ (Two places!)	AGH
99		7	$\lim_{t \rightarrow a_o} \implies \lim_{t \rightarrow t_o + a_o}$	MS
102		-4	$[t_o - a, t_o + a] \implies [t_o - c, t_o + c]$	
102		-1	for $t \in J \implies$ for $t \in [t_o - a, t_o + a]$	
103		12	In the exponent, $2K$ should be K .	RC
103	-5	use Theorem 3.18 to \implies extend Theorem 3.18 to the nonautonomous case to	HLS	

Ch.	Page	Line	Change	Thanks
4	107	-10	the orbit (4.2). \implies the orbit Γ_x .	MS
	110	4	defines a complete flow \implies exists for all $t \in \mathbb{R}$	MS
	110	10	Theorem 3.17 \implies Theorem 3.18	JA
	110	-10	The vector field F defines a flow on $\mathbb{R}^n \implies$ The solutions exist for all $t \in \mathbb{R}$	MS
	111	11	and therefore define a flow. \implies and therefore, if $f \in C^1$, define a flow.	MS
	111	-11	Theorem 3.17 \implies Theorem 3.18	JA
	113	-1	when E^c is empty \implies when E^c is trivial	RC2
	121	6	$f_i(x^* + \delta x_j) \implies f_i(x^* + \delta x_j \hat{e}_j)$ AND $g_i(\delta x_j) \implies g_i(\delta x_j \hat{e}_j)$	
	122	11	$ y_o \leq \delta \implies y_o \leq \delta$	
	130	Ftnt 24	“continuous, bijective map that” \implies “continuous, bijective map between compact sets that”	SS
	131	4	“itself, and thus” \implies “itself with a C^1 inverse, and thus”	SS
	135	-10	“map φ ” \implies “surjective map φ ”	HLS
	136	-7	$= (h_2(x_1, x_2) + tx_2) \implies = (h_1(x_1, x_2) + tx_2)$	SS2
	139	-6	$e^{-tA} \cdot H_1 \cdot \varphi_t(x) \implies e^{-tA} \circ H_1 \circ \varphi_t(x)$	
	145	-16	$\in \omega(s) \implies \in \omega(x)$	MS
	148	18	$\omega(x) \in B \implies \omega(x) \subset B$	MS
	148	-16	Lemma 4.14 \implies Lemma 4.15	MS
	148	-6	“is a subset M of N ” \implies is a neighborhood $M \subset N$	MS
	158	15-22	Replace these lines with \implies basis vectors perpendicular to $f(x_o)$, then WW^T is the projection onto S where $W = (w_1, w_2, \dots, w_{n-1})$. The matrix DP in the w_i basis has the representation $W^T DQ(x_o)W$. Since $W^T f(x_o) = 0$, we obtain $DP(x_o) = W^T MW .$ Now add the unit vector $\hat{f} = f(x_o)/ f(x_o) $ to W to form the orthogonal matrix $U = (W, \hat{f})$. The spectrum of M is identical to that of the similar matrix $\tilde{M} = U^T MU = \begin{pmatrix} DP(x_o) & 0 \\ \hat{f}^T MW & 1 \end{pmatrix} .$ Because the last column has only one nonzero element, $\det(\lambda I - \tilde{M}) = (\lambda - 1) \det(\lambda I - DP(x_o))$. \square	HPR
	163	10	$\mathbb{R}^+ \times \mathbb{S} \implies \mathbb{R}^+ \cup \{0\} \times \mathbb{S}$	

Chap.	Page	Line	Change	Thanks to
5	173	-11	$Df(x_o) = A \implies Df(x^*) = A$	TB
	177	-5	Replace this line with \implies any t and any $\varepsilon > 0$ there is a $T \geq t$ such that $v(t) \leq u(T) + \varepsilon$. Thus, using (5.22), gives	SS & MS
	177	-4,-2,-1	for each equation \implies add an ε to the right hand side of each of the three inequalities.	
	178	1	$u(T + s) \leq v(T) = v(t) \implies u(T + s) \leq v(t)$	
	178	5	$z(t) \leq M + \frac{L}{\beta} \int_0^t z(s) ds \implies z(t) \leq M + \varepsilon e^{\alpha t} + \frac{L}{\beta} \int_0^t z(s) ds$	
	178	6	replace this line with \implies This is of the form of the Grönwall's lemma in Ex. 3.9, so that $z(t) \leq (M + \varepsilon e^{\alpha t}) e^{tL/\beta}$. Since this is true for <i>any</i> $\varepsilon > 0$, rewriting it in	
	186	3	where E^c is empty. \implies where E^c is trivial.	MS
	186	5	where E^c is not empty. \implies where E^c is not trivial.	MS
	186	14	C^k invariant manifolds $\implies C^k$ locally invariant manifolds	TB
190	-7	$\dot{z} = z \implies \dot{z} = \lambda z$	MS	
6	220	13-14	such that $f(x) \neq 0$ for all $x \in \Sigma \implies$ such that whenever $x \in \Sigma$, $f(x)$ is transverse to Σ	TB
	222	-8	The sixteenth \implies Part of the sixteenth	
	222	-6-7	Replace the phrase beginning "to show" with \implies "to find an upper bound for the number of limit cycles for a polynomial vector field on \mathbb{R}^2 ."	JMG
	222	-2	(Shi, 1988) \implies (Shi, 1980)	HPR
	223	1	$\lambda = 10^{-200} \implies \lambda = -10^{-200}$	HPR
	223	3	unstable foci \implies foci	HPR
7	245	-8	$\theta_1(t_n) = \alpha_n \implies \theta_1(t_n) = \alpha_1$	TB
	251	1	$\Phi(t; xv) \implies \Phi(t; x)v$	
	256	3	In equation (7.21) flip the sign of both x 's in the matrix	
	259	2	When $\mu_1 < \mu_2 \implies$ When $\mu_1 \leq \mu_2$	
	263	-2	$\mu_1 + \mu_2 \leq \text{tr}(Df) \implies \mu_1 + \mu_2 \geq \text{tr}(Df)$	
	263	-1	Thus there \implies Thus if the spectrum is regular there	
	265	-6	that $\chi(F) \leq \chi(f) \implies$ that $\chi(F) \leq \max(0, \chi(f))$	AML, ASD

Chap.	Page	Line	Change	Thanks to
8	269	-11	that as $\mu \rightarrow \infty \implies$ that as $\mu \rightarrow -\infty$	SS2
	271	-6	$(x_o, \mu_0) \implies (x_o, \mu_o)$	
	274	1-2	Replace sentence with “The range of dynamics of the induced vector field f can be as rich as those of g , but may also be simpler.”	MS
	274	19	$= Dh f(x; p(\nu)) \implies = Dh(x; p(\nu)) f(x; p(\nu))$	MS
	274	20	of $(0, 0)$. \implies of $(0, 0)$, recall (4.34).	MS
	275	Fig 8.5	$f(x; \nu) \implies f(x; \mu)$	
	280	Fig 8.7	$\alpha(\mu) \implies m(\mu)$	MS
	280	-1	Using the definition (8.16) of m , \implies Using $m(\mu) = f(\xi(\mu); \mu)$,	MS
	289	-1	$1 + \beta + r^2 \implies 1 + \beta r^2$	
	290	-6	$g_1(x; \eta(\mu), \mu) \implies g_1(x; \eta(x; \mu), \mu)$	
	294	Fig 8.9	of (8.49) for \implies of (8.46) for	AA
	294	-7	$b = 1 \implies b = -1$	AA
	303	-9	$f : C^3(\implies f \in C^3($	
	303	-7	$D_x^2 f(0; 0) \implies D_x^2 f(0; 0) = 0$	
9	361	8	$(2n - 1)n \implies (2n + 1)n$	
	362	4	$(2n - 1)n \implies (2n + 1)n$	
	371	-8	$ m \cdot \omega > c \implies m \cdot \omega \geq c$	
	371	-7	The set $\mathcal{D}_{c,\tau}$ is a \implies The set $\mathcal{D}_{c,\tau} \cap \mathbb{S}^{n-1}$ is a	
	371	-1	$> \frac{d}{ q ^{\tau+1}} \implies \geq \frac{d}{2 q ^{\tau+1}}$	
	372	1	with $d = c/\omega_2 \implies$ with $d = 2c/\omega_2$	
	372	4	$[0, d/2]$ and $[1- \implies [0, d/2]$ and $(1-$	
App	394	3	<code>meshgrid(-pi,pi/10,pi) \implies meshgrid(-pi:pi/10:pi)</code>	JA
Ref	405	Shi	Replace with \implies Shi, S. L. (1980). “A Concrete Example of the Existence of Four Limit Cycles for Plane Quadratic Systems.” <i>Sci. Sinica</i> 23(2): 153-158.	