Errata

2nd Edition Ordinary Differential Equations and Applications, 2nd Ed.

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p. 113, Ex.1.224 $r > 1$ should be $r \geq 1$.

p. 125, l. -6 $\Delta(\gamma, h)$ (the last y in this line must be h).

p. 126, Ex. 1.245 Remove (c). Change (d) to (c) and change (e) to (d).

p. 130 N must be replaced by M in the last displayed formula.

p. 134 U_1 must be replaced by U_0 in the last two displayed formulas.

p. 136 In Theorem 1.260 the last part of the statement should be changed to:

such that $t \mapsto \sigma(t, x, \lambda)$ is a solution of the differential equation 1.59 and $\sigma(0, x, \lambda) = x$. In particular, $t \mapsto \sigma(t, x_0, \lambda_0)$ is a solution of the initial value problem 1.60.

p. 136 In the second paragraph of the proof, the symbol x_0 in the first two lines must be replaced by the phrase "at the origin".

p. 147 The second inequality in display (2.3) is redundant.

p. 177 A v is missing in the second integral on the second line of the third display.

p. 203 In the third display ϕ should be φ.

p. 204 In the first display ϕ should be φ.

p.221 The last paragraph on page 221 and first two paragraphs on page 222 should be replaced by:

Given $\sigma \in \Sigma$, define

$$s_n := nT(p) - \sum_{j=0}^{n-1} T(\mathcal{P}^j(\sigma)).$$

Note that

$$(n+1)T(p) - nT(p) = T(\mathcal{P}^n(\sigma)) + s_{n+1} - s_n,$$

and, as a result,

$$|s_{n+1} - s_n| = |T(p) - T(\mathcal{P}^n(\sigma))| \leq 2\|DT(p)\|\|p - \mathcal{P}^n(\sigma)\|.$$

Hence,

$$|s_{n+1} - s_n| < 2\|DT(p)\|C\|p - \sigma\|\lambda^n$$

whenever $n \geq 0$.

Note that because $s_n = s_1 + \sum_{j=1}^{n-1}(s_{j+1} - s_j)$ and

$$\sum_{j=1}^{n-1} |s_{j+1} - s_j| < 2C\|DT(p)\|\|p - \sigma\| \sum_{j=1}^{n-1} \lambda^j < 2C\|DT(p)\| \frac{\|p - \sigma\|}{1 - \lambda},$$

the series $\sum_{j=1}^{\infty}(s_{j+1} - s_j)$ is absolutely convergent—its absolute partial sums form an increasing sequence that is bounded above. Thus, in fact, there is a number s such that $\lim_{n\to\infty} s_n = s$. Also, the sequence $\{s_n\}_{n=1}^{\infty}$ is uniformly bounded; that is,

$$|s_n| \leq |s_1| + 2C\|DT(p)\| \frac{\|p - \sigma\|}{1 - \lambda} \leq K.$$

Hence, the absolute value of its limit $|s|$ is bounded by the same quantity.

p. 329 The hyperbolic estimates can be obtained as a corollary to Theorem 2.60 by translating the spectrum. New 2nd paragraph would read:

By the hypotheses of the theorem, there is a constant $K > 0$ such that for all $\xi \in \mathbb{R}^k$ and for all $\nu \in \mathbb{R}^\ell$, we have the following exponential estimates

$$\|e^{tS}\xi\| \leq Ke^{at}\|\xi\|, \qquad \|e^{-tU}\nu\| \leq Ke^{-bt}\|\nu\|$$

for all $t \geq 0$. A direct proof of these estimates under the spectral gap condition is similar to the proof of Theorem 2.60. These estimates can also be obtained as a corollary to this theorem. Hint: Apply Theorem 2.60 to new operators $S + cI$ and $U + cI$, where c is a real number chosen so that there is a spectral gap containing the origin.

p 332 In the third display (after "to show that", the mathematical phrase $((1 + \rho)$ must be replaced by $(1 + \rho)$. Also the last parenthesis in the second line of the display must be removed. In the fourth display, the factor $(1 + \rho)$ must be inserted after the first K.

p. 334 The symbol dt in the last display must be replaced by ds.

p. 336 The round brakets in the second line of formula 4.18 must be removed.

p. 336 Formula 4.18 is not correct. The problem is that $G_x W(\phi_1) \neq G_x W(\phi_2)$. This part of the proof thus requries more complicated estimates. The desired result is true.

p. 338 In the third display, the second occurrence of the letter Γ must be replaced by Λ.

p. 340 In display 4.21 all occurrences of F must be replaced by lower case f.

p. 341 In the last line of the first full paragraph, all occurrences of ν should be replaced by μ.

p. 342,l. -4 The formula in this line must read $D\Lambda(\phi) = \Psi(\phi, D\phi)$; that is the symbol D must be inserted at the beginning of the formula. Also, the first sentence of the following paragraph should read: The transformation $\Gamma : \mathcal{B}^0_\rho(\mathbb{R}^m, \mathbb{R}^k) \times \mathcal{F}_\rho \to \mathcal{B}^0_\rho(\mathbb{R}^m, \mathbb{R}^k) \times \mathcal{F}_\rho$ given by $\Gamma(\phi, \Phi) = (\Lambda(\phi), \Psi(\phi, \Phi))$ is a fiber contraction.

p. 348 The first sentence of the statement of Lemma 4.7 must be changed to read "... is a smooth function such that $p(0) = 0$."

p. 351 In the sixth display, all the fractions $\frac{1}{1-\lambda}$ must be changed to $\frac{2}{1-\lambda}$.

p. 352 In the line after equation 4.27, the sentence should be changed to "...it is easy to see that $F^*(H(x)) = H(A(x))$ for all $x \in \mathbb{R}^n$, where $F^*(x) := f^*(x) + Ax$." Also, in the next display (in the following paragraph) the two occurrences of the letter F should be changed to F^*.

p. 355 The first symbol in the display following 4.30 must be changed from ψ_t to ψ_{-t}. Also, this same change must be made in the second to the last display.

p. 356 In the first display two occurrences of ψ_t must be changed to ψ_s. In the third display, two occurrences of $B\phi_t$ must be changed to $B\psi_t$.

p. 358 In the last display in the Proof of 4.13, after the first equality, the symbol $D\phi_t$ must be changed to $D\phi_{-t}$.

p. 361-362 Four occurrences of the symbol h in the last paragraph starting on page 361 and continuing to page 362 must be changed to G: the occurrences are " the continuous function h", "easy to prove that h", "image under h" and "bijective continuous map h.