

Errata for “Partial Differential Equations”, AMS Press

Second Printing

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This is a second file of corrections for my PDE book.

All errors in the first printing found before September 1, 1999 were fixed, and so the errata listed here represent mistakes which survived into the second printing.

Last modified: September 4, 2003.

CHAPTER 2

page 22, line 6: Change to “ $\log(|v'|)$ ”.

page 27, line -12: Change to “ $B(x_0, r)$ ”

page 30, lines -8 and -9: Change C_1 to $\sqrt{n}C_1$.

page 81, line -6: Change the first $[0, \infty)$ to $[s, \infty)$.

page 84, line -9: Change to “ $B(x_0, t_0) \times \{t = 0\}$ ”.

page 87, line 5: Assume $u \in C^2(\bar{U}^+)$.

CHAPTER 3

page 163, line 9: Change to “ $x_1u_{x_1} + 2x_2u_{x_2} + u_{x_3} = 3u$ ”.

CHAPTER 4

page 174, line -1: Change the lower limit of integration from 0 to 1.

page 184, line -2: This holds for $u, v \in L^1 \cap L^2$.

page 215, lines 10-21: Replace what is written with this:

“Then for $m = 1, \dots,$

$$\left| \int_{\mathbb{R}^n} e^{\frac{i\phi(y)}{\epsilon}} \zeta(y)a(y) dy \right| = O(\epsilon^m),$$

where $\zeta \in C_c^\infty$ vanishes near $\{y_1, \dots, y_N\}$. This follows since we can employ Lemma 3,(i) to change variables near any point in the support of ζ to make ϕ affine, with nonvanishing gradient, and apply Lemma 1.

On the other hand if ζ is smooth, ζ vanishes except near y_k , and $\zeta(y_k) = 1$, we can

employ Lemma 3,(ii) to compute

$$\begin{aligned}
 \int_{\mathbb{R}^n} e^{i\phi(y)} \zeta(y) a(y) dy &= \int_{\mathbb{R}^n} e^{i\phi(\Phi(x))} \zeta a(\Phi(x)) |\det D\Phi(x)| dx \\
 &= e^{\frac{i\phi(y_k)}{\epsilon}} \int_{\mathbb{R}^n} e^{\frac{i}{2\epsilon}(x-y_k) \cdot D^2\phi(y_k)(x-y_k)} \zeta a(\Phi(x)) \\
 &\hspace{15em} |\det D\Phi(x)| dx \\
 &= e^{\frac{i\phi(y_k)}{\epsilon}} \frac{(2\pi\epsilon)^{n/2}}{|\det D^2\phi(y_k)|^{1/2}} e^{\frac{i\pi}{4} \operatorname{sgn}(D^2\phi(y_k))} (a(y_k) + O(\epsilon)),
 \end{aligned}$$

according to Lemma 2. Using these estimates and a partition of unity, we thereby obtain the asymptotic formula . . . ”

page 221, line -1: The various x 's should not be subscripts.

page 227, line -1 and line -11: Change $s\sqrt{n}$ to s/\sqrt{n} .

page 228, line -5: Omit “by m ”.

CHAPTER 5

page 246, line -3: Change numerator in the fraction to $|\alpha|$.

page 253, line -8: Change to “ B^0 ”

page 255, line 5: Change to $u \in C^1(\bar{U})$.

page 257, line -14: Remove the second “only”

page 260, lines -11,-12: Change \mathbb{R} to \mathbb{R}_+ .

page 261, line 6: Change to $m \rightarrow \infty$.

page 270, line -10: Change to “ $|\alpha| \leq k$ ”.

page 270, line -8: Change to “ $|\beta| \leq k - 1$ ”.

page 282, line -9: Square the H^k norm.

page 282, line -5: Square the L^2 norms.

page 284, line 5: Change $B[u, v]$ to (u, v) .

page 285, line 11: Change “measurable” to “strongly measurable”.

page 286, line -10: Change to “ $L^p_{loc}(0, T; X)$ ”

page 287, line -3: H^1 should be H^{-1} .

CHAPTER 6

page 302, line -13: b_{i, x_i} should be $b^i_{x_i}$.

page 302, line -10: Change to “ $H_0^1 \times H_0^1$ ”

page 321, line -6: Change α to a .

page 321, lines -5 and -6: Change U to U' .

page 328, lines 10,12: Change o_{ik} to o_{ki} , o_{jl} to o_{lj} .

page 332, line 6: Should be “Theorem 2”.

page 341, line 1: Change to “ $[\frac{n}{2}] + 3$ ”.

page 341, line 2: Change to “Theorem 6 in §5.6.3”.

CHAPTER 7

page 364, line -11: Change $B[\dots, t]$ to $B[\dots]$.

page 367, line 4: Remove the superscript 2 on the last term.

page 377, line 11: Change to “ $u_t + Ku \leq -cu$ ”.

page 377, line 13: Change to “ $v = M$ at (x_0, t_0) ”.

page 381, line 9: Delete “ C^2 ”.

page 405, line 6: Change to “ $\max_{0 \leq t \leq T} (\|\mathbf{u}^\epsilon(t)\|_{H^1(\mathbb{R}^n; \mathbb{R}^m)} + \|\mathbf{u}^{\epsilon'}(t)\|_{L^2(\mathbb{R}^n; \mathbb{R}^m)})$ ”

CHAPTER 8

page 443, line -5: Change α to δ .

page 443, line -4: Add the phrase “and for an appropriate constant $\delta > 0$ ”.

page 446, line -2: Add the sentence: “We may select the sets E_ϵ so that $E_\epsilon \subseteq E_{\epsilon'}$ for $0 < \epsilon' < \epsilon$.”

page 456, line -10: Change \mathbb{R} to \mathbb{R}^n .

page 458, line 4: Remove the phrase: “most notably that L depends only on p ”.

page 487, Problem 2: “Hint: Look for a Lagrangian L which contains an exponential term involving ϕ .”

page 487, Problem 3: “Hint: Look for a Lagrangian L which contains the term $e^{-\frac{t}{\epsilon}}$.”

page 488, line 3: The exponent of $1 + |Du|^2$ should be $-\frac{3}{2}$.

(My apologies: I have several times posted various incorrect fixes for this error.)

page 488, line 7: Change to $\partial\Sigma$.

CHAPTER 9

page 501, line 15: Change the second \mathbf{w} to $\tilde{\mathbf{w}}$.

CHAPTER 10

page 553, line 10: There is a notational problem here, since h denotes both the running cost and the time step.

page 563, line -7: Change to “are viscosity solutions”.

CHAPTER 11

APPENDICES

page 617, line -5: Change “ $x_i x_j$ ” to “ $x_i x_i$ ”.

page 625, line -5: Change the second η to η' .

page 627, line -10: Change to “ $\gamma(y_1, \dots, y_{n-1})$ ”.

page 627, line -6: Change “ $\det \Phi = \det \Psi = 1$ ” to “ $\det D\Phi = \det D\Psi = 1$ ”.

page 628, line 11: Change to “... we employ (2) with v_{x_i} replacing v ”.

Please let me know about any other errors you find, at evans@math.berkeley.edu.

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