Corrections of the Book “PME” by Juan Luis Vázquez
in the published version: Oxford University Press, Nov 2006

blue color means new version, red color means erased text, [...] means orders or suggestions

Errata and corrections

Chap 1
• page 4, lines -4, -3: the statement is loose. This is a precise version
"HE: A non-negative solution of the heat equation defined in a space-time region \( Q = \Omega \times [t_0, t_1] \), which is not identically zero at \( t = t_0 \), is automatically positive everywhere for \( t > t_0 \)."

Chap 2
• page 20, line -5: [wrong letter]
"m = k = ... " [must be] "\( \varepsilon = k = ... \"
• page 24, line -3: [wrong letter in formula]
\( -(k/\mu) h_x \)
• page 25, line 3: [wrong letter in formula]
...\( = \rho g k/2\varepsilon\mu \)

Chap 3
• page 42, line 8: [wrong inequality sign] \( |w_t| \leq c|u_t| \)

Chap 4
• page 61, line 7: [add to sentence] "... \( O(t^\beta) \)" [must be] "... \( O(t^\beta) \), with \( \beta = \alpha/d \)."
• page 67, line -10: [erase] "any" in "any p"
• page 71, line -9: "decreasing sequence” [must be] "increasing sequence”
• page 72, line -2: "but they are ” [must be] "but they are not”

Chap 5
• page 105, lines -3, -2 [see modified formula]
\[
\int_Q |\nabla \Phi_n(u_n)|^2 dx dt + \int_\Omega \Psi_n(u_n(T)) dx + \int_Q G_{n,t} u_n dx dt + \int_\Omega u_n(0) G_n(0) dx \\
= \int_\Omega \Psi(u_n,0) dx + ...
\]
• page 106, line 11: \( \Phi'_n(x, u_n) \) [must be] \( \Phi'_n(u_n) \)
• page 108, in formula (5.57): "(N/R^2)" [must be] "(NR^2)"
• page 113, line -12: [add ] ”Then, if for instance \( d = 1, \)”
• page 114, line -12: ”radius \( R/2\) [must be] ”radius \( R\)”
• page 115, line 3: ”\(|x| \leq 2R\) [must be] ”\(|x| \leq R\)”

Typos or improved text

Chap 1
• page 14, line 5: [wrong word]”over most over” [must be] ”over most of”

Chap 2
• page 22, formula (2.17): [letter case is wrong] formula begins as ”\( \partial_t \Psi(T) =...\)”

Chap 3
• page 34, line 5: [add a dot after] \( \partial \Omega \).
• page 36, line 15; [erase red word] ”... at immediate.”
• page 40, lin -3: [replace] \( \nabla_w = 0 \) by \( \nabla w = 0 \)
• page 43, line 23: [better wording, change] ”\( \Phi(u) \)” into ”\( \Phi = \Phi(u) \)”
• page 44, line 16: [change wording] ”Problem HDP” into ”the initial value problem”
• page 46, line 14; [change wording] ”CP” into ”Cauchy problem”

Chap 4
• page 52, line at Section 1.1 +1: ”an role” [must be] ”a role”
• page 53, line -5: ”is a solution” [must be] ”gives a solution”
• page 54, line 10: [erase] ”the” before ”Chapter”
• page 63, line 2: ”\( U \)” [must be] ”\( U \)”
• page 63, line 7: [erase repeated final words] ”in the PME”
• page 66, line at formula (4.4) + 1: after ”\( (4.22)\)” [insert] ”, and \( \beta = \alpha/d.\)”
• page 73, line 2: [erase second instance of ”interesting” (to avoid repetition)
• page 76, line 23: ”book of ...” [must be] ”books of ...”
• page 77, line 18: ”converge” [must be] ”convergence”

Chap 5
• page 97, line 8: ”which forces ...” [must be] ”and this forces ...”
• page 97, line 9: ”will ...” [must be] ”will be ...”
• page 107, line 5: [erase] ”in a homogeneous medium”
• page 114, line 11: [add comma] ”like extinction, that”
• page 116, line -13, -12: [modify sentence into] ”mass diffusion, heat propagation and gas flow…”
• page 119, line 19: [wrong spelling] ”Padrón”
• page 121, line 8: [change a word] ”of the HDP for…”
• page 121, line 10: [add word] ”(with improved properties…”

References

• page 601, ref [223] original date missing, it is 1863

Index

• page 621: join Bénilan, P., to Bénilan, Ph.
• page 624: join Type II into of Type II
OLD CORRECTIONS

chap 5
page 81, lin 5.1.1 - 3: new capital sigma $\Sigma$ must be the same type as previous
page 107, line -8 $g' \leq 0$ changes to $g' \geq 0$
page 107, line -5 just after with $a(t) > 0$. insert
This implies that $v(R, t) \geq 0$ for all $t > 0$.
and continue
page 107, line -5 $v(r, 0) < 0$ changes to $v(r, 0) \geq 0$,
page 107, line -5 $v \leq 0$ changes to $v \geq 0$
page 115, line +2 after Remark after Corollary 5.22 : change the position of the word was
as follows
... zero for a degenerate parabolic equation was in its day ...

chap 6
page 126, line 13 of text, insert comma before namely
page 135, paragraph 6.2.2 line 6 change formula from
$u_t = \Delta \Phi(u) = \Delta \phi(u) + f$ to $u_t = \Delta \Phi(u) + f$
pag 144, line 5, beginning of line : $Q_T$ changes to $Q$
pag 149, I think a blank line is needed between the first line (Problems) and the second
line (Problem 6.1)

chap 8
pag 190, line 7 : formula $\|v(t) - u(t)\|_+$ changes to $\|v(t) - u(t)\|_1$

chap 9
pag 203, line 12 insert $= \frac{\beta \alpha}{d}$ changes to $\beta = \frac{\alpha}{d}$
pag 207, paragraph 9.5.3, line 6 : change sentence both a supersolution and a supersolu-
tion... into both a supersolution and a subsolution...
pag 210 lines -3 and -4 : some times $u$ must be $U$: note the correct lines
$$U(x - x_0, \tau'; M') \leq u_0(x) \leq U(x - x_0, \tau; M).$$
By Theorem 9.2 we get $U(x - x_0, t + \tau'; M') \leq u(x, t) \leq U(x - x_0, t + \tau; M)$,
pag 213, line 8, insert word as follows
... when $p \geq 2$ is an even integer...
chap 13
page 310, line 5,6,7 after formula (13.1) eliminate whole sentence?

chap 15
page 370, line 1 after second display: second formula \( s(0+) \geq \) must have a 0, not the letter \( O \) (just as the first)
page 377, revise all \( L \)'s

chap 16
page 407, line +5 after formula (16.24): replace \( K = L^\gamma \) by \( K = L^{-\gamma} \)
page 408, line -1 before paragraph "Heat equation and fast diffusion equation": replace \( 0 < t < T_1 \), by \( 0 < t < TT_1 \).

chap 17
page 442, formula (17.15): replace \( n \) by \( d \) in the right-hand side of the formula (=before \( \geq \)), it must look like the right-hand side of formula (17.14).
page 450, third display, replace last exponent \( n \) by \( d \). It must say \( KL^{-d}M \).
page 451, formula (17.46) replace \( n \) by \( d \) in first fraction. It says
\[
\alpha_p = \frac{d}{\ldots}
\]

chap 18
pag 455. paragraph that begins "We will explore...". line 5, replace \( u \) by \( U \). It must say \( U(x,t;C) \).
page 457, line 3 after Figure 18.1 change Figure 18.1:) into Figure 18.1)
page 458, check long new sentence
page 479, line 4 replace using by . Using
page 493, line -6 replace finite mass, by infinite mass,
page 493, line -5 replace infinite mass, by finite mass,
page 495, line 10 replace case by cases
page 495, lines 11, 12, 13 to be eliminated (they appear again below!)
page 495, line -7 replace sill by still
page 497, line -2 replace (iii) by (ii)
ojo a las paginas 491 a 515

chap 19
page 516, line -2 to ”19.6 Various” Replace Aleksandrov’s by Aleksandrov’s

chap 21
page 554, line -2, -3 replace constant constant by constant