Errata for "Heat Kernel and Analysis on Manifolds"
October 26, 2017

P. 6. Before Remark 1.2 there should be twice "$t \to 0$" instead of "$t \to \infty$".

P. 32. In the top line there should be "After we have proved (2.25)" instead of "After we have proved using (2.25)".

P. 66. There should be

$$\widetilde{v}_k = v^i J_i^k$$

instead of

$$v_k = v^i J_i^k.$$

P. 167. There should be "To prove (6.47) observe that by (6.45)..." instead of "To prove (6.47) observe that by (6.40)..."

P. 297. There should be

$$v^i = g^{ij} u_j$$

instead of

$$v^i = g^{ij} u_i.$$

P. 298. In Remark after Exercise 10.26, there should be: "for any $\alpha \leq \lambda_{\min}(M)$" instead of "$\alpha \geq \lambda_{\min}(M)$".

P. 298. In Exercise 10.27(b) there should be "$u = 1 \bmod W_0^1(M)$" instead of "$u \in 1 \bmod W_0^1(M)$".

P. 398. Proof of Corollary 15.6 should be corrected as follows.
Proof. Assume first $t \leq 2R^2$. The function $u(t,\cdot) = P_t f$ satisfies the hypotheses of Theorem 15.1. Since $\|u(t,\cdot)\|_{L^2} \leq \|f\|_{L^2}$, we obtain

$$\int_0^t \int_{B(x,R)} u_+^2 d\nu \leq t\|f\|_{L^2}^2,$$

whence by Theorem 15.1

$$u_+^2(t,x) \leq \frac{Ca^{-n/2}t}{\min\left(\sqrt{t},R\right)^{n+2}}\|f\|_{L^2}^2 \leq C'a^{-n/2}\left(R^{-n}+t^{-n/2}\right)\|f\|_{L^2}^2.$$

Applying the same argument to $u = -P_t f$, we obtain the required estimate for $|P_t f(x)|^2$. Next, replacing x by any point $x' \in B(x, R/2)$ and applying the above estimate in the ball $B(x', R/2)$ instead of $B(x,R)$, we obtain (15.22).

For $t > 2R^2$ we apply the already proved case of (15.22) with R^2 instead of t and $P_{t-R^2}f$ instead of f. Since

$$P_{R^2}P_{t-R^2}f = P_t f,$$

we obtain

$$\begin{aligned}\sup_{B(x,R/2)}|P_t f| &\leq C'a^{-n/4}\left(R^{-n/2}+\left(t-R^2\right)^{-n/4}\right)\|P_{t-R^2}f\|_{L^2}\\ &\leq C''a^{-n/2}R^{-n/2}\|f\|_{L^2},\end{aligned}$$

which finishes the proof. ∎

P. 407. Before Corollary 15.17 there should be

$$p_t(x,y) \sim \frac{c}{t^{n/2}}\left(\frac{\rho^2}{t}\right)^{\frac{n-1}{2}}\exp\left(-\frac{\rho^2}{4t}\right)$$

instead of

$$p_t(x,y) \sim \frac{c}{t^{n/2}}\left(\frac{\rho^2}{t}\right)^{n/2-1}\exp\left(-\frac{\rho^2}{4t}\right).$$