CORRECTIONS - Lecture notes on RWRE

1. Page 200, line 6, reverse < to > in first indicator.
2. Page 202, lines 2,3,10,12,13, replace $\rho_{(-i)}$ by $\rho_i$.
3. Page 206: the right side of equation (2.1.23) should be replaced by

$$\prod_{\ell=1}^{L} \binom{m+k}{k} (\omega_i^0)^{m_1} (\omega_i^k)^{k_1}.$$

Last line, right most $E_\omega$ should be erased.

4. Page 207, last line, $\varpi(n)$ should be replaced by $\varpi(j)$.

5. Page 209, display below (2.1.29), the sum $\sum_{i=2}^{\infty}$ should be multiplied by $1/\omega_1^+$ and the sum $\sum_{i=1}^{\infty}$ should be multiplied by $1/\omega_0^+$.

6. Page 212, line -2 (Remark): As F. Rassoul-Agha pointed out to me, the argument given only shows that

$$P\left(\left|\frac{X_n - v_p n - Z_n}{\sqrt{n \sigma_1}}\right| > \Phi(-x) > \delta\right) \to n \to \infty 0,$$

which gives less than a full-blown quenched CLT; To give a full quenched CLT requires an additional estimate. Update: Jon Peterson, in his thesis, has completed the details of this argument, by using hitting times. See arXiv:0810.0257v1 [math.PR], and also Ilya Goldsheid’s article “Simple transient random walks in one-dimensional random environment: the central limit theorem”, Probab. Theory Related Fields 139 (2007), pp. 41–64.

7. Page 213, section 2.3: A better version of this argument, that avoids some of the coupling arguments and hence gives better conditions, is available at


8. Page 219, line 2, replace $\leq \delta$ by $< \delta$.

9. Page 228: line 1, write $M_{1,\epsilon} = M_{1,\epsilon,P}$ and erase in line 5 the sentence “Let .....”.

10. Page 230, last display, last line: add (twice) $h(\eta|P)$.

11. Page 232, display below (2.3.47), last line: replace $\lambda_0(u)$ by $\lambda_0(u, \eta)$.

12. Page 239, line below (2.4.13), replace $\tilde{\tau}_k$ by $\tilde{\tau}_{i}^{(i)}.$
13. Page 240, (2.4.14) and (2.4.15): (2.4.14) does not follow from the $\alpha$ mixing condition ($D3$). It does follow if one assumes $\beta$ mixing instead. Alternatively, (2.4.14) holds true if instead of the last summand in the right hand side one writes $n^2 m_k \alpha(2k)/4 + m_k p(\tilde{\tau}^{(1)} > n^2)/4 =: B(n)$. Using Lemma 2.4.16 and the definition of $\alpha(2k)$, one then replaces (2.4.15) by the estimate $B(n) \leq o(n^{1-\varepsilon})$.

14. Page 247, (2.4.34), a factor $(1 - v/v_P)^{1/3}$ is missing on the right hand side.

15. Page 250, line 5, it would be clearer to write

$$LHS \leq \frac{1}{1 + \exp\left((\log n)((\bar{d} n) - W_n(\bar{a} n))\right)}$$

where $\theta_n$ is the location of the maximum of $W^n$ on $(0, \bar{b} n)$, and then continue (using the good event) with the current inequalities; line 9, replace $\omega_{a+1}^n$ by $\omega_{a+1}^n$. Line 12, replace $2J^2$ by $2J^2(\log n)^2$.

16. Page 251, lines 3 and 19, replace $P_{\omega}^{i_n}$ by $P_{\omega}^{i_n}$. Line 19, last display in proof, replace in right side $(\bar{b} n + \delta)$ by $J$.

17. Page 252, equation (2.5.12), replace $B_{-\alpha}$ by $B_{\alpha}$ (recall $\alpha < 0$!).

18. Page 255, display (2.5.17): replace $Q(E_Q(\bar{b}(h) = \bar{b}(1)|\Gamma(h)))$ by $E_Q(Q(\bar{b}(h) = \bar{b}(1)|\Gamma(h)))$.

19. Page 255, display below (2.5.17): remove $s_-(1) = s_-(t)$ from the conditioning.

20. Page 256, line 4 and (2.5.19), condition on $s_+(1) = s_+(t)$. Line 5, add ) at end of line. Line 16, replace $f(z, \omega)$ by $f(z, w)$ and replace $e^{-w-(t-1)}$ by $e^{w(-(t-1))}$.

21. Page 258: all of the multi-dimensional chapter 3 actually assumes that $P(\omega(0, 0) > 0) = 0$, that is no holding times. This should have been stated explicitly as part of (A2).

22. Page 262, line -2, erase the words is omitted.

23. Page 263, last line, add ) after $h$.

24. Page 264: in lines 5 and 9, $P$ should be replaced by $P^o$ (twice in each line). In line 11, $Q^o$ should be $Q^o$. Finally, in line -7, $X_{\tau_k+y}$ should be replaced by $X_{\tau_k+y}$.

25. Page 265, in the left hand of (3.2.8), one should divide by $\tau_k$, not by $k$.

26. Page 268, line 8, replace lim inf by lim sup.

27. Page 270, change the index of summation in both sums in (3.3.7) from $i$ to $k$, replace $X_{i-1}$ by $X_{k-1}$, and $\varpi(i)$ by $\varpi(k)$.2
28. Page 279, line 15, should have \( A := [2\varepsilon, 1-2\varepsilon(d-1)] \). Line 19, \( Y_n^{\tilde{\alpha}} = X_n e_1 \).
Display below (3.3.24), \( g_{n+1,\omega}(x+1) \) should be \( g_{n-1,\omega}(x+1) \).

29. Page 300, lines 5-6, replace \( x \) by \( x_1 \) (\( x_1 \) is as in (3.5.19)). Line 8, replace \( \inf \) in the right hand side by \( \sup \), and \( \alpha \) by \( \bar{\alpha} \). In (3.5.20), replace \( x_0 \) by \( x \), and in lines -4 and -3, replace \( i \) by \( i_0 \). It is a good idea to replace \( X_i \) by \( \xi_i \) in the second half of the page.

30. Page 304, (3.5.25), replace \( \tau_2 - \tau_2 \) by \( \tau_2 - \tau_1 \).

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