

Response: Recovering the Brownian Coalescent Point Process from the Kingman Coalescent by Conditional Sampling

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We would like to thank the referee for his/her thorough review and highly appreciate the comments and suggestions. Please find below a detailed response to the each of the comments.

General Comment

“So I would recommend another round of polishing by the authors before publication, perhaps also providing some more precise references, both internally (to properties introduced in previous sections) and to external papers (for example, in some of the cases where the authors simply write it is well-known that, or just refer to a paper without giving the exact reference of the result in the paper).”

We went through the paper one more time and made sure to suppress the inconsistencies of notation (see e.g. (25) below). We also removed all the “it is well known that” and instead, we provided precise references for those results (for instance the reference to Bertoin’s book Page 8, N. Berestycki Page 9, Ethier and Kurtz P 11). Further, we also followed the instruction of the referee in her/his “detailed remarks”, and added a few more references when needed (see e.g. (8) below). Finally, as requested by the referee, we also added more internal references to make the paper more readable.

Detailed Comments

1. We agree with the referee. We replaced CPP by Brownian CPP.
2. Again, we agree with the referee. We added the condition $N \rightarrow \infty$ at the end of the first paragraph.
3. We added the sentence “the continuous-time branching process where individuals die and give birth to new individuals at the same rate equal to 1”. We also refer the reader to a Figure in the Popovic paper. “See Fig. 2 in [P04] fo a pictorial representation of such a process.”
4. We clarified our statement. “See Fig. 1 of the present paper or Fig. 7 in [L08]”.
5. We agree with the referee. However, as pointed by the referee, this is a subtle point, and for the sake of clarity, we decided to leave the text as it is.
6. We agree with the referee. We clarified our statement by writing “(asymptotically) embedded” instead of “embedded”.

7. Here, we are not sure to see what the referee means (“How does this averaged sampling account for the random population size of a sub-population with shallow genealogy?”)
8. We added the following reference “introduced in Section 3.2. exemple 1 of [BL03]”
9. Indeed, you are right, the convergence of discrete flows of bridges to continuous flows has been proved in Bertoin & Le Gall (2003). We have changed the paragraph accordingly.
10. We agree with the referee. We modified the manuscript accordingly.
11. The multiplicative constant could probably be explained by the $1/2$ renormalization of the Brownian local time. We added a sentence in this direction.
12. done.
13. We agree with the referee that the LD process of Donnelly and Kurtz also encodes the dynamics of the coalescent. We added a reference on the LD process (we added a sentence to point out this relation). We believe that the flow of bridges point of view is another interesting perspective that we are currently investigating. We added the following sentence “In an an ongoing work, we show how the evolving Kingman comb can be nicely expressed in terms of a Markov process with stationary and independent “increments””.
14. done
15. We gave a reference to Durrett’s book.
16. done
17. We agree with the referee. We erased “until further notice”.
18. done
19. As pointed out by the referee, \mathcal{A}_0 is \mathcal{A}^0 . We changed the text accordingly.
20. Y^0 is actually \mathcal{Y} . We modified the text accordingly.
21. done
22. done
23. done
24. done
25. We replaced l_i^ε by l_ε^i everywhere. However, we kept the notation $l_{n,\varepsilon}$ as it is ($l_{n,\varepsilon}$ is different from l_ε^n and was defined in (13)). We added one sentence to highlight this difference in notation : “To avoid any confusion, we note in passing that l_ε^n (the length of the n^{th} block) is different from the random variable $l_{n,\varepsilon}$ ”.
26. At the beginning of the section, we wrote “In this section, we fix $n \in \mathbb{N}^*$ ”. As a consequence, we removed n in the statement of Lemma 4.5.
27. done

- 28. done
- 29. done
- 30. We removed some of the blanks to get a nicer display.
- 31. done
- 32. done
- 33. done
- 34. done
- 35. done
- 36. done
- 37. done
- 38. We agree with the referee that the $dt_i - t_{i+1}$ was a bit ambiguous. We tried to clarify the argument (still keeping the same dt notation for the sake of simplicity).