Recommender's review and decision for manuscript entitled 'Proper account of auto-correlations improves decoding performances of state-space (semi) Markov models.

Decision: (minor) revision
The authors have answered in a very satisfying way almost all the comments of the first round of revision. Reviewer 2 asks for more clarifications on one of her initial comments. I follow this request and I describe below the reason.

Review: Following the second revision of reviewer 2, I recommend to clarify in the protocol presentation and in the discussion, which comparisons are made and why. It was not obvious for me and reviewer 2 to recover this information, so I think a less attentive reader could miss it. In particular, I understand, but I may be wrong, that based on figure 9, bottom right, you compare the accuracy obtained with the HSMM-AR1 model on real data and the accuracy obtained with the mixture model of data simulated from a HSMM-AR1 model with parameters learned on the real data. I don't understand the reason of this comparison since both the data and the models are different.

Regarding the HSMM framework, there exists several versions of HSMM, from the more general to that described in Barbu and Limnios 2008 and to a simpler one referred to as ED-HMM or ED-HSMM. In the manuscript the authors describe the HSMM of Barbu and Limnios 2008. However the definition of the kernel is not as in this book. The probability of sojourn duration should be conditionally to the current state and the next state (see Barbu and Limnios p 3, or 45-46). However, in practice usually the user works with a simpler model where it depends only on the current state, this is the ED-HMM. I think in the experiments the model used in the ED-HMM, but this should be clarified.