Referee report on the paper "A timed version of the plactic monoid" by Amritanshu Prasad

The paper under review defines a continuous (*timed*) version of the plactic monoid and discusses its properties. It is my opinion that the paper in its current form doesn't have enough merit (in terms of novelty) for publication. More precisely,

(1) The idea of RSK with continuous input is not new. For instance, see the following papers by Neil O'Connell, *A path-transformation for random walks and the Robinson-Schensted correspondence* (Trans. Amer. Math. Soc. 355 (2003), no. 9, 3669–3697, see sections 7 and 10.3) and *Conditioned random walks and the RSK correspondence* (Random matrix theory. J. Phys. A 36 (2003), no. 12, 3049–3066). These papers study continuous RSK because of the probabilistic applications. Even the paper *Introduction to tropical combinatorics* by Anatol N. Kirillov (quoted by the author) has the subsection 3.3 titled *Continuous analog of the Robison-Schensted-Knuth correspondence*. Although the author of the latter paper doesn't go into details, it is clear that one can substitute positive numbers instead of integers in the $(\max, +)$ definition of the RSK.

(2) The author describes his generalization in the language of the plactic monoid. All the arguments are completely analogous to the classical discrete ones.

(3) In many cases, there is a straightforward reduction to the discrete case. Suppose, for instance, that we want to prove Theorem 3.4.1, a continuous version of the Greene's theorem. By continuity it is enough to do that for a word w with all rational exponents. By scaling it is enough to do that for a word w with all integer exponents. It is clear that in such case all subintervals of all subwords $u_1, u_2, \ldots, u_k$ maximizing $a_k(w)$ can be taken to have integer endpoints. Now just apply the usual Greene's theorem.

(4) No applications/motivations for working with continuous RSK are provided.