Report on paper

On the stationary distribution of a switching stochastic process

The paper considers a process starting at zero and initially following the trajectory of a Levy processes who increments have a positive drift. Upon overshooting a threshold b, the process' position is set to b exactly, and the process then follows the trajectory of another Levy process, this time with increments with a negative drift. Upon reaching the negative half-line, the process is reset to zero, ad the new cycle starts, repeating the above. This proceeds indefinitely.

The authors improve their earlier results on the Laplace-Stieltjes transform of the stationary distribution of the process, and on its asymptotics as $b \to \infty$ under the Cramer-like conditions.

The results seem to be correct and new, and the paper is well written. I recommend it for publication. Below are a few remarks/suggestions:

- I wondered where such processes may appear. I do not insist on the authors providing motivation but if they are aware of some applications, it would be beneficial for the reader to see them.
- When authors state at the end of the introduction that their new results are more amenable to numerical calculations of the characteristics of the processes, what exactly do they mean? It would be good to see a remark explaining this, perhaps following the corresponding theorem.
- Perhaps related to the previous comment: could Theorem 3 be used to get an idea about the asymptotics of the first couple of moments of the stationary distribution?
- In some of the double integrals (e.g. bottom of page 3), it would be beneficial for the reader to see which variables correspond to which integral. The one on the page 3 may look more readily understandable if written in the way $\int\limits_{t=0}^{\infty} ... \int\limits_{x=-\infty}^{\infty}$
- In the definition of $L(A)$, it may be better to write "For a Borel set A, let $L(A)$ be the set of functions..."
- Something is not quite right with the definitions of passage times on page 5. The process ξ is not defined - perhaps it should be ξ_1 for one of the passage times and ξ_2 for the other?
- When the function h appears for the first time before Lemma 1, it would perhaps be a good idea to precede the equation introducing it with "there exists a function h..."