## A Proofs

Recall the assumptions that  for some minimal time , that , and that  is homogeneous in time.

For any positive , define the notation:



At most one jump can occur in any time interval , and it may occur at any time in that interval. This implies that either  with  if a jump occurs, or  if no jump occurs.

To simplify the proof of Proposition 1 somewhat, we further assume that  admits a density, although this is not strictly necessary. The below proofs are similar if one wishes to adopt discrete hold times; assuming, for example, that jumps can only occur at the end of a processor’s clock cycle. Here we assume that jumps can occur at any real time, and that we may query the state of the process at any real time.

*Proof of Proposition 1.* The transition kernel is



where



We have:



To demonstrate that  is the invariant distribution, it is sufficient to show that the above equals :



*Proof of Corollary 2.* We have:



*Proof of Corollary 3.* We have:



*Proof of Proposition 5.* The transition kernel is:



where



We have:



To demonstrate that  is the invariant distribution, it is sufficient to show that the above equals :

