Addendum: "A Counterexample to Small-time Limit Theorems for Stochastic Processes"

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ARTICLE HISTORY
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(1) In the premise of Lemma 2 (beginning of Section 2.2), the main idea is that $(\sigma\sigma')(x)$ yields diffusion in at least one component; hence corresponds in at least one coordinate to a covariance matrix $\Sigma\Sigma'$ with nonzero diagonal. Alternatively, read: "$\exists k : (\Sigma\Sigma')_{k,k} > 0$", which is more direct.
(2) In the conclusion of the proof of Lemma 14, alternatively to checking UI, one may note that $|\mathbf{E}[\varphi(F_a^n)] - \mathbf{E}[\varphi(V^n)]| \leq 2\|\varphi\|_\infty P(\tilde{\tau}^n(X) > a)$, which yields the conclusion.