Goodness of fit test for small diffusions by discrete time observations

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Abstract We consider a nonparametric goodness of fit test problem for the drift coefficient of one-dimensional small diffusions. Our test is based on discrete time observation of the processes, and the diffusion coefficient is a nuisance function which is "estimated" in some sense in our testing procedure. We prove that the limit distribution of our test is the supremum of the standard Brownian motion, and thus our test is asymptotically distribution free. We also show that our test is consistent under any fixed alternative.

Keywords Small diffusion process · Discrete time observations · Asymptotically distribution free test