

The evaluation criteria use the following function defined in "Multiple Change Point Estimation With a Total Variation Penalty".

$$\varepsilon(A||B) = \sup_{b \in B} \inf_{a \in A} |a - b|$$

We calculate two error types: $n^{-1}\varepsilon(\hat{T}||T^*)$ and $n^{-1}\varepsilon(T^*||\hat{T})$ where \hat{T} represents the change point estimation and T^* represents the true change point. The first type of error can be interpreted as the maximum error in the change-point location from estimated change points to true change points, the second type of error may be interpreted as the maximum error in the change-point location from true change points to estimated change points.

Table 1: Simulation Result of n=1000

		Low Noise		Medium Noise		High Noise	
<i>Method</i>	<i>Criteria</i>	Mean	SD	Mean	SD	Mean	SD
SIFS	$\varepsilon(\hat{T} T^*)$	0.00000	0.00000	0.00002	0.00014	0.00345	0.00242
	$\varepsilon(T^* \hat{T})$	0.00410	0.01414	0.00391	0.01981	0.01095	0.02211
	FDR	0.00827	0.02584	0.00694	0.02443	0.23069	0.10778
	PDR	1.00000	0.00000	0.99833	0.01173	0.78750	0.10215
LS-TV(K=11)	$\varepsilon(\hat{T} T^*)$	0.00029	0.00046	0.00022	0.00042	0.00609	0.00802
	$\varepsilon(T^* \hat{T})$	0.00029	0.00046	0.00022	0.00042	0.01039	0.02852
	FDR	0.02217	0.03800	0.01833	0.03469	0.14250	0.07883
	PDR	0.97583	0.03800	0.98167	0.03469	0.85750	0.07883
LS-TV	$\varepsilon(\hat{T} T^*)$	0.00001	0.00010	0.00001	0.00010	0.01370	0.01001
	$\varepsilon(T^* \hat{T})$	0.04651	0.05443	0.05022	0.05486	0.00729	0.02807
	FDR	0.07635	0.05556	0.07902	0.05117	0.13074	0.08609
	PDR	0.99917	0.00833	0.99917	0.00833	0.82500	0.09213

Table 2: Simulation Result of n=5000

		Low Noise		Medium Noise		High Noise	
<i>Method</i>	<i>Criteria</i>	Mean	SD	Mean	SD	Mean	SD
SIFS	$\varepsilon(\hat{T} T^*)$	0.00000	0.00000	0.00001	0.00007	0.00099	0.00084
	$\varepsilon(T^* \hat{T})$	0.00000	0.00000	0.00151	0.00992	0.00143	0.00393
	FDR	0.00000	0.00000	0.00718	0.02543	0.21404	0.09321
	PDR	1.00000	0.00000	0.99583	0.01825	0.78833	0.09206
LS-TV(K=11)	$\varepsilon(\hat{T} T^*)$	0.00004	0.00008	0.00004	0.00008	0.00329	0.00710
	$\varepsilon(T^* \hat{T})$	0.00004	0.00008	0.00004	0.00008	0.00454	0.02315
	FDR	0.01667	0.03350	0.01667	0.03350	0.13833	0.09268
	PDR	0.98333	0.03350	0.98333	0.03350	0.86167	0.09268
LS-TV	$\varepsilon(\hat{T} T^*)$	0.00001	0.00004	0.00001	0.00002	0.01099	0.00992
	$\varepsilon(T^* \hat{T})$	0.04173	0.05013	0.04177	0.05150	0.02131	0.01819
	FDR	0.06387	0.04549	0.06973	0.03192	0.12431	0.08361
	PDR	0.99583	0.01825	0.99833	0.01173	0.83250	0.09288

Now the change point are not constant

Table 3: Simulation Result of n=1000

<i>Method</i>	<i>Criteria</i>	Low Noise		Medium Noise		High Noise	
		Mean	SD	Mean	SD	Mean	SD
SIFS	$\varepsilon(\hat{T} T^*)$	0.00000	0.00000	0.00002	0.00014	0.00345	0.00242
	$\varepsilon(T^* \hat{T})$	0.00410	0.01414	0.00391	0.01981	0.01095	0.02211
	FDR	0.00827	0.02584	0.00694	0.02443	0.23069	0.10778
	PDR	1.00000	0.00000	0.99833	0.01173	0.78750	0.10215
LS-TV(K=11)	$\varepsilon(\hat{T} T^*)$	0.00029	0.00046	0.00022	0.00042	0.00609	0.00802
	$\varepsilon(T^* \hat{T})$	0.00029	0.00046	0.00022	0.00042	0.01039	0.02852
	FDR	0.02217	0.03800	0.01833	0.03469	0.14250	0.07883
	PDR	0.97583	0.03800	0.98167	0.03469	0.85750	0.07883
LS-TV	$\varepsilon(\hat{T} T^*)$	0.00001	0.00010	0.00001	0.00010	0.01370	0.01001
	$\varepsilon(T^* \hat{T})$	0.04651	0.05443	0.05022	0.05486	0.00729	0.02807
	FDR	0.07635	0.05556	0.07902	0.05117	0.13074	0.08609
	PDR	0.99917	0.00833	0.99917	0.00833	0.82500	0.09213

Table 4: Simulation Result of n=5000

<i>Method</i>	<i>Criteria</i>	Low Noise		Medium Noise		High Noise	
		Mean	SD	Mean	SD	Mean	SD
SIFS	$\varepsilon(\hat{T} T^*)$	0.00000	0.00000	0.00002	0.00014	0.0034	0.0031
	$\varepsilon(T^* \hat{T})$	0.00410	0.01414	0.00391	0.01981	0.0067	0.0100
	FDR	0.00827	0.02584	0.00694	0.02443	0.2301	0.1232
	PDR	1.00000	0.00000	0.99833	0.01173	0.7825	0.1196
LS-TV(K=11)	$\varepsilon(\hat{T} T^*)$	0.00029	0.00046	0.00022	0.00042	0.0121	0.0095
	$\varepsilon(T^* \hat{T})$	0.00029	0.00046	0.00022	0.00042	0.0276	0.0365
	FDR	0.02217	0.03800	0.01833	0.03469	0.1492	0.0897
	PDR	0.97583	0.03800	0.98167	0.03469	0.8508	0.00897
LS-TV	$\varepsilon(\hat{T} T^*)$	0.00001	0.00010	0.00001	0.00010	0.0121	0.0095
	$\varepsilon(T^* \hat{T})$	0.04651	0.05443	0.05022	0.05486	0.0276	0.0365
	FDR	0.07635	0.05556	0.07902	0.05117	0.1492	0.0897
	PDR	0.99917	0.00833	0.99917	0.00833	0.8508	0.00897