

RECTANGULAR \rightarrow HANNING

ERROR $O(\bar{N}^{-1/2}) \rightarrow O(\bar{N}^{-1})$ (5)(29)

DOMINANT MDW INTERPOLATION ERROR

AVERAGING: $\hat{G}_{M,H}(k) = \frac{\sum \varphi_{i,H}^{(1)} \bar{U}_{i,H}^{(1)}}{\sum |U_{i,H}^{(1)}|^2}$

BIAS: $\lim_{M \rightarrow \infty} \hat{G}_{M,H}(k) = G_0(k) + 2 G_0^{(1)} \frac{P_{U_0, U_0} \Delta^2}{6 P_{U_0, U_0}} - G_0^{(2)} \frac{\Delta^2}{6}$
 $= G_0(k) + O(\bar{N}^{-2})$
 $P_{U_0, U_0} = E\{|U_0(k)|^2\}$

$O(\bar{N}^{-1}) \rightarrow O(\bar{N}^{-2})$

VARIANCE: $\text{var}\{\hat{G}_{M,H}(k)\} = \frac{|G_0^{(1)}(k) \Delta|^2}{3M} = O(\bar{M}^{-1} \bar{N}^{-2})$

FOR WHITE NOISE EXCITATION:

$P_{U_0, U_0}(k) = \phi$

$\lim_{M \rightarrow \infty} \hat{G}_{M,H} - G_0 \approx \frac{\text{diff}(\text{diff}(\hat{G}_{M,H}(k-1)))}{6}$

$\text{std}(\hat{G}_{M,H}(k)) = \frac{\text{diff}(\hat{G}_{M,H}(k-1))}{\sqrt{3M}}$

$\text{diff}(X(k)) = X(k+1) - X(k)$

WINDOW	R1 LEAKAGE	R2 INTERPOLATION	SYSTEMATIC $M \rightarrow \infty$	VAR
RECT	$O(\bar{N}^{-1/2})$	ϕ	$O(\bar{N}^{-1})$	$O(\bar{M}^{-1} \bar{N}^{-1})$
HANNING	$O(\bar{N}^{-5/2})$	$O(\bar{N}^{-1})$	$O(\bar{N}^{-2})$	$O(\bar{M}^{-1} \bar{N}^{-2})$
POLYNOMIAL R=2	$O(\bar{N}^{-3/2})$	$O(\bar{N}^{-3})$	$O(\bar{N}^{-3})$	$O(\bar{N}^{-6})$

$N \rightarrow N \cdot M$ IF MORE RECORDS MEASURED

LPM APPLIED ALWAYS TO FULL $N \cdot M$ TIME WINDOW