

# Piecewise constant approximation

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Let  $s(t)$  be a continuous bandlimited signal. Let  $p(t)$  be its best piecewise constant approximation on the uniformly partitioned unit interval  $[0,1]$ ,

$$\text{i.e } p(t) = \sum_{i=1}^n c_i I_i(t)$$

where  $I_i(t)$  is the indicator function which takes 1 on the interval  $[(i-1)/n, i/n)$  and 0 elsewhere.

Now how does the MSE  $\|s(t)-p(t)\|^2$  vary with  $n$  ?

Thanks,  
er

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