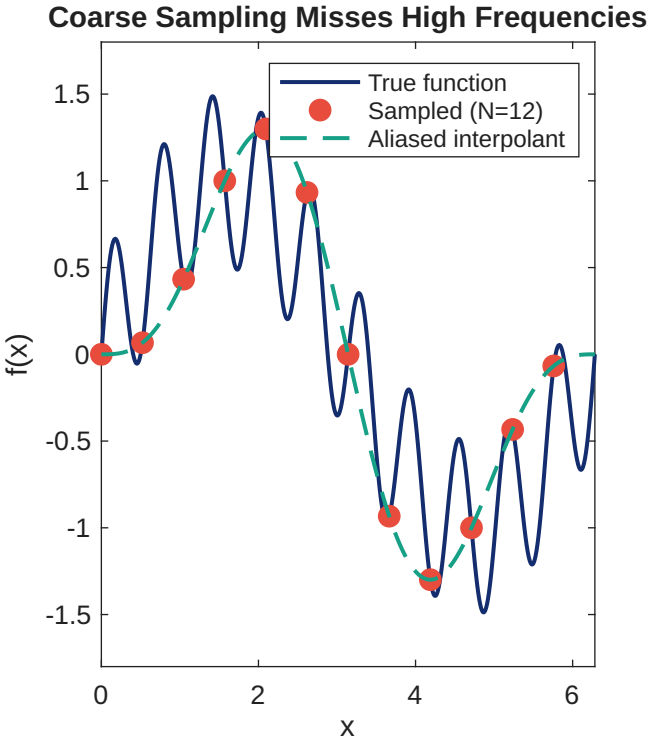
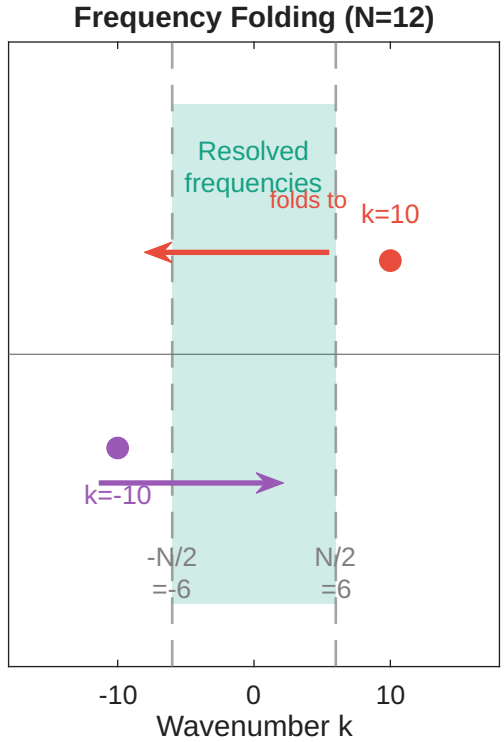
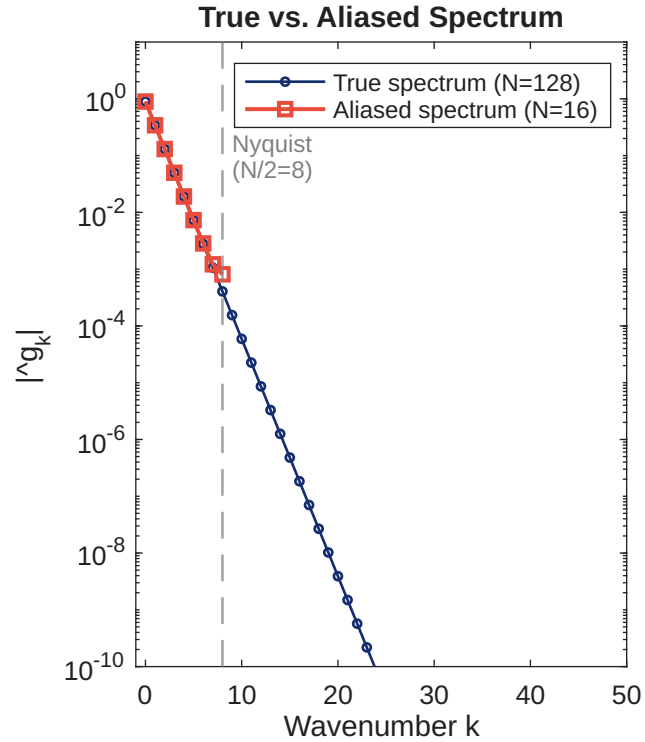

Coarse Sampling Misses High Frequencies
True function
Sampled (N=12)
Aliased interpolant
f(x)
x
1.5
1
0.5
0
-0.5
-1
-1.5
0
2
4
6


Frequency Folding (N=12)
Resolved
frequencies
folds to
k=10
k=-10
-N/2
=-6
N/2
=6
-10
0
10
Wavenumber k


True vs. Aliased Spectrum
True spectrum (N=128)
Aliased spectrum (N=16)
Nyquist
(N/2=8)
|^g_k|
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
0
10
20
30
40
50
Wavenumber k