

Signal Processing - 1 by One

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- So Far: Sampling and Convolution
- Fourier Series and Fourier Transform
- Previous Session: Laplace Transform, Shannon Sampling
- Today: Discrete-time Fourier Transform (DTFT)



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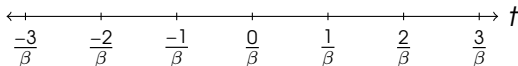
Digital-to-Analog



Digital-to-Analog



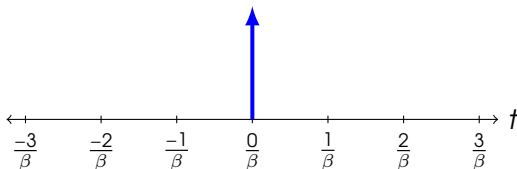
Discrete-time Input and Response:



Digital-to-Analog



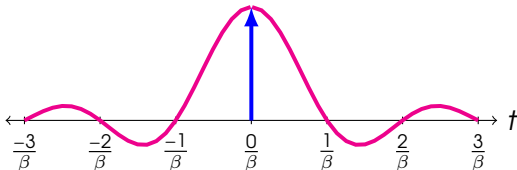
Discrete-time Input and Response:



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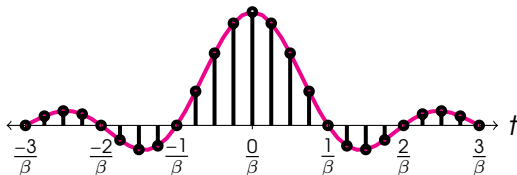
Discrete-time Input and Response:



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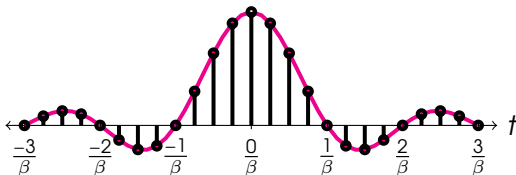
Discrete-time Input and Response:



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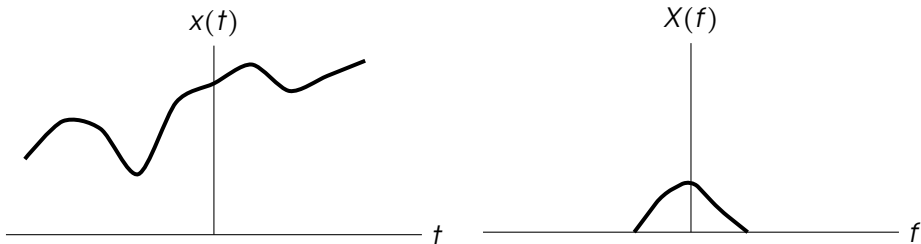
Discrete-time Input and Response:



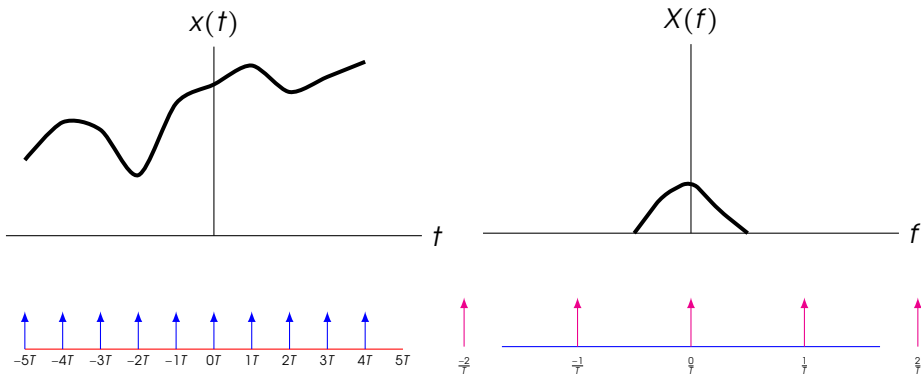
GNURADIO: Generate a baseband signal with bandwidth 10kHz



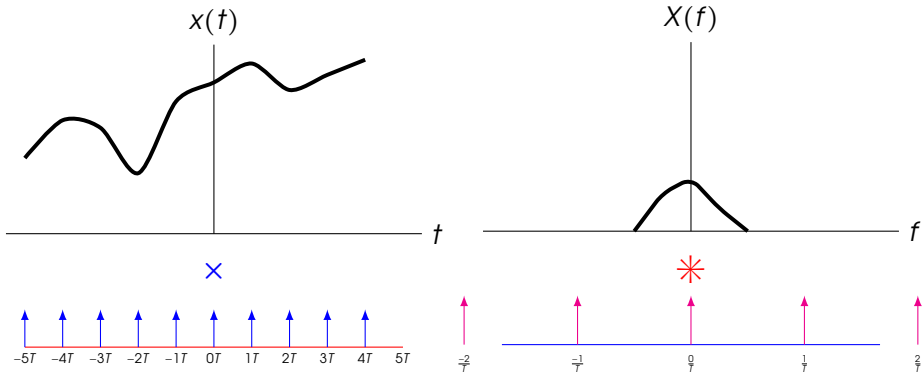
DTFT Illustration



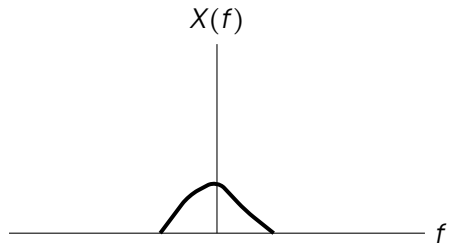
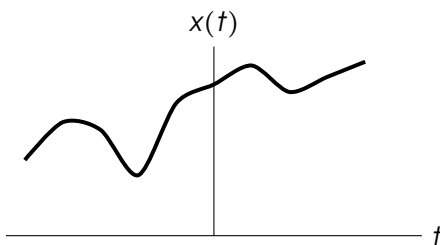
DTFT Illustration



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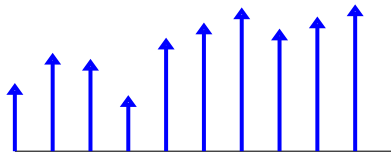
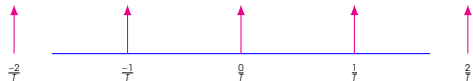
DTFT Illustration



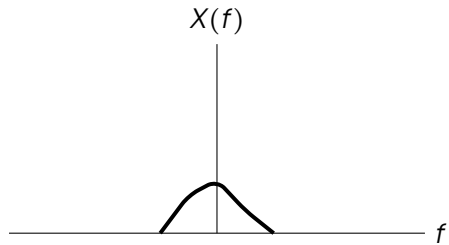
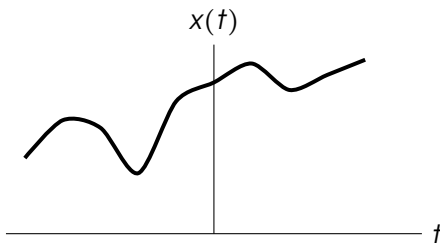
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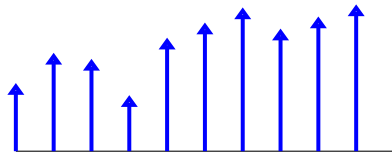
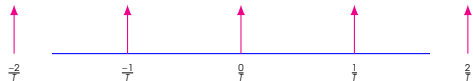
DTFT Illustration



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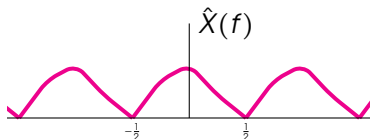
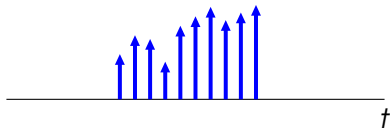
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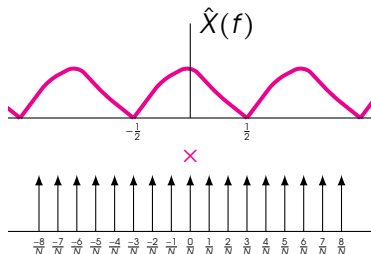
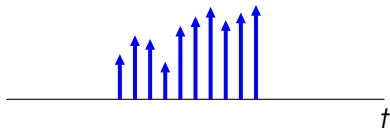
Take $T = 1$ for DTFT



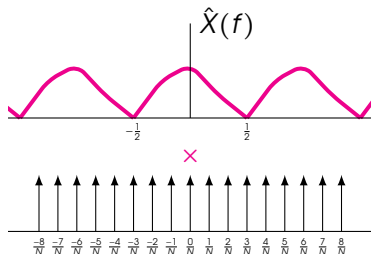
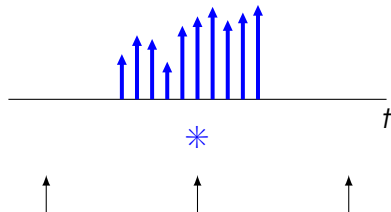
DFT: Sampling DTFT



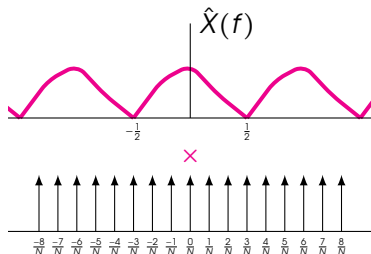
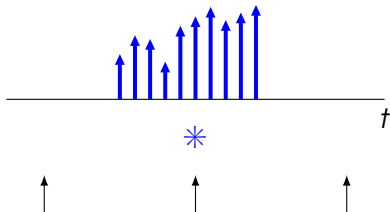
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