

Oversampling (3B)

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Band-limited Signal

$$f_s > 2 \cdot f_H$$

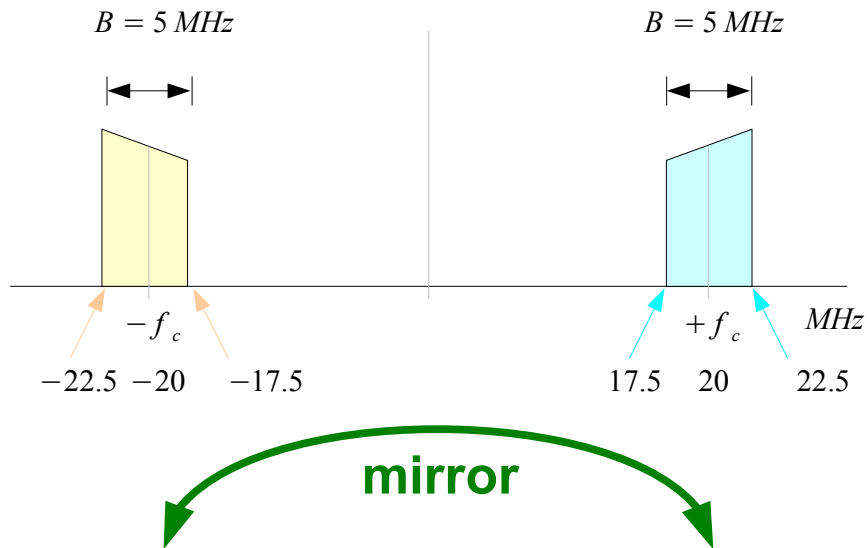
$$f_{\text{oversampling}} = 4^n \cdot f_s$$

Oversampling and Decimation
Oversample and Lowpass Filter

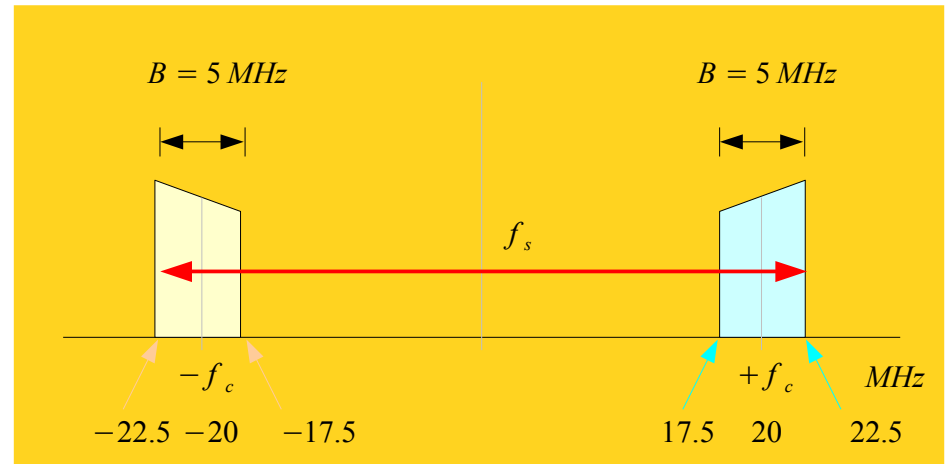
- Normal Averaging
- Decimation / Interpolation



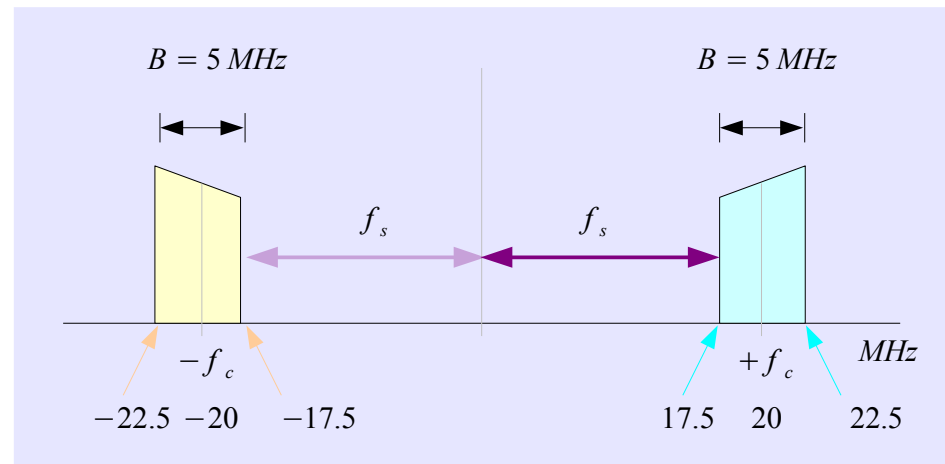
Band-limited Signal



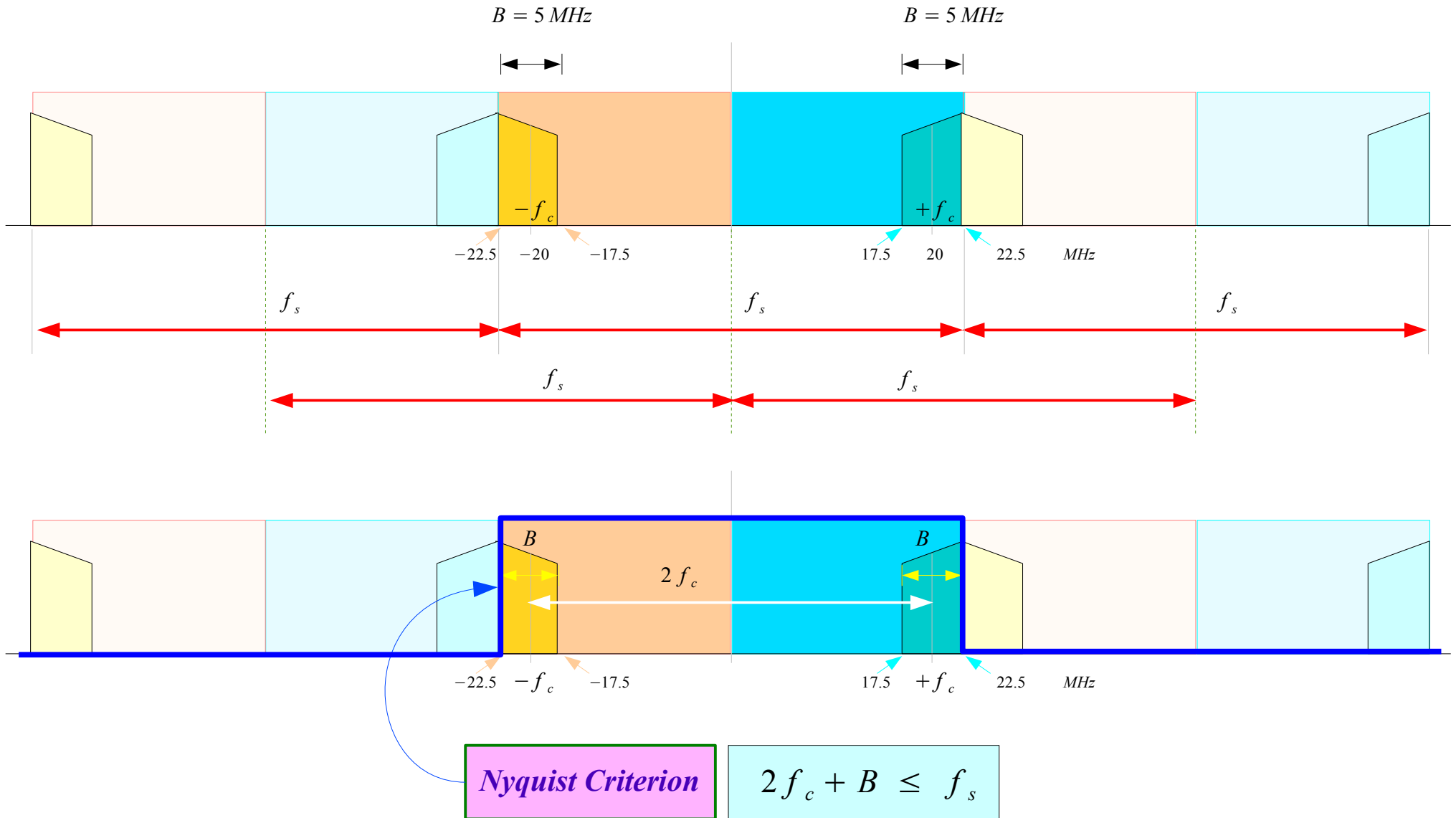
- Bandpass Sampling
- IF filtering
- Harmonic Sampling
- Sub-Nyquist Sampling



- Lowpass Sampling



Low-pass Signal Sampling



References

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- [4] R. G. Lyons, Understanding Digital Signal Processing, 1997
- [5] AVR121: Enhancing ADC resolution by oversampling