

Bahan Ajar

Chapter 3



Materi Pembelajaran

Matakuliah :

WIRELESS SENSOR NETWORKS

Kode Matakuliah : SKO 20428

Prodi : **SISTEM KOMPUTER**

Dosen Pengampu Matakuliah:

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Modulation

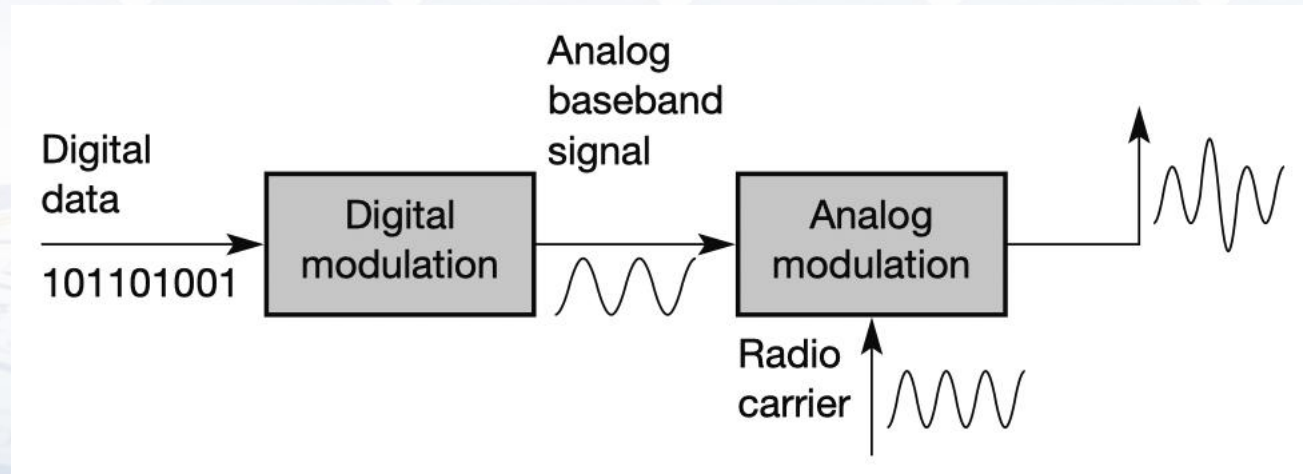
As for digital modulation, three different basic schemes are known for analog modulation:

Amplitude modulation (AM),
Frequency modulation (FM), and
Phase modulation (PM).



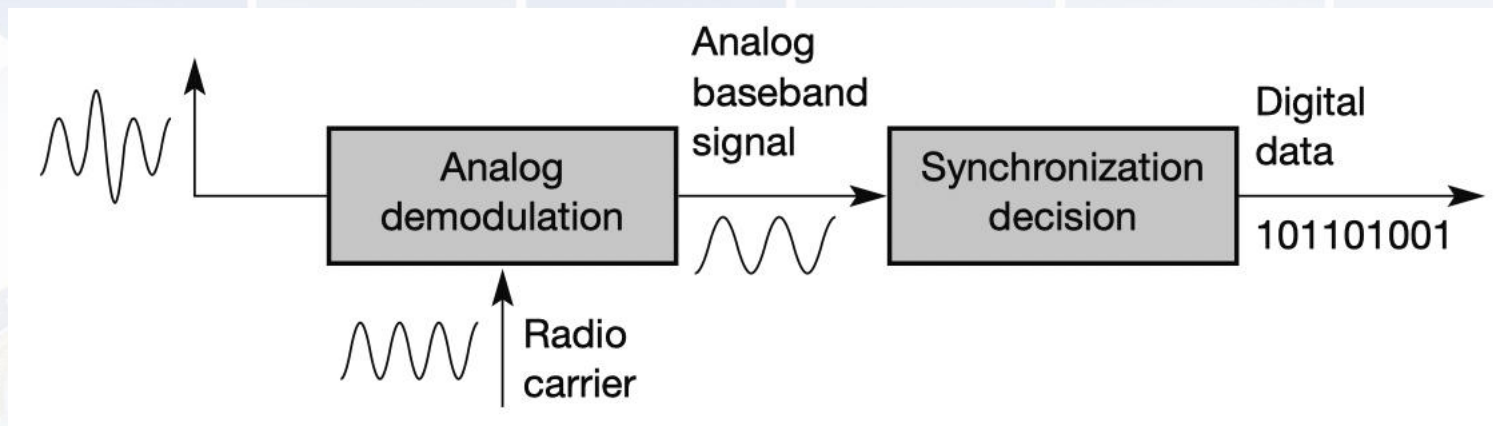
Modulation

The analog modulation then shifts the center frequency of the analog signal up to the radio carrier. This signal is then transmitted via the antenna.



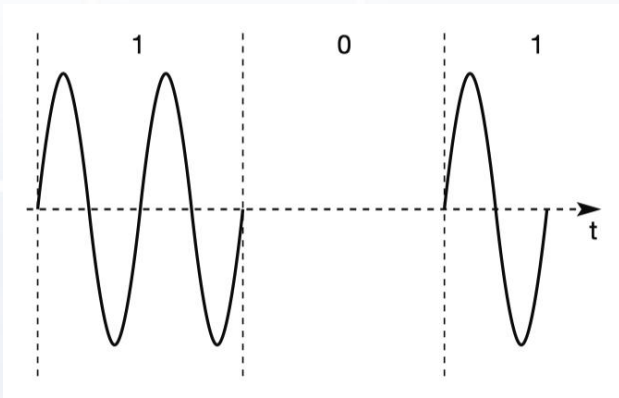
Demodulation and data Reconstruction

Receives the analog radio signal via its antenna and demodulates the signal into the analog baseband signal with the help of the known carrier.

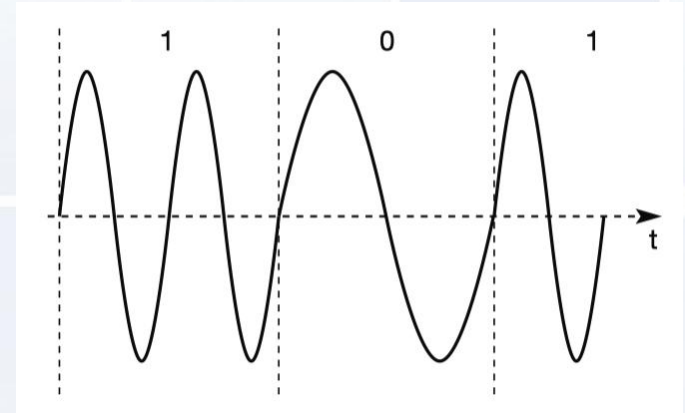


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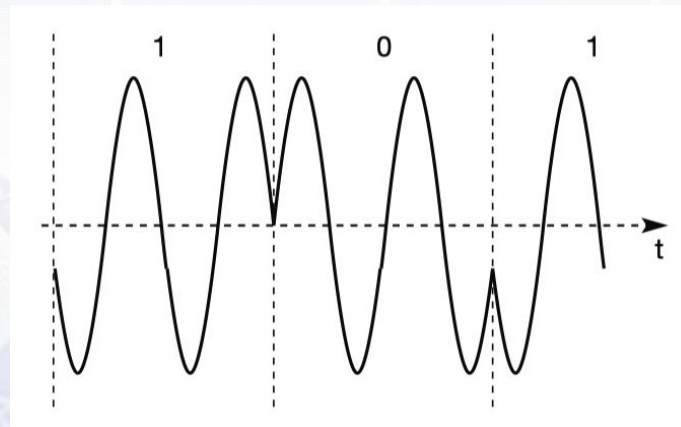
ASK, FSK and PSK



Amplitude shift keying (ASK)



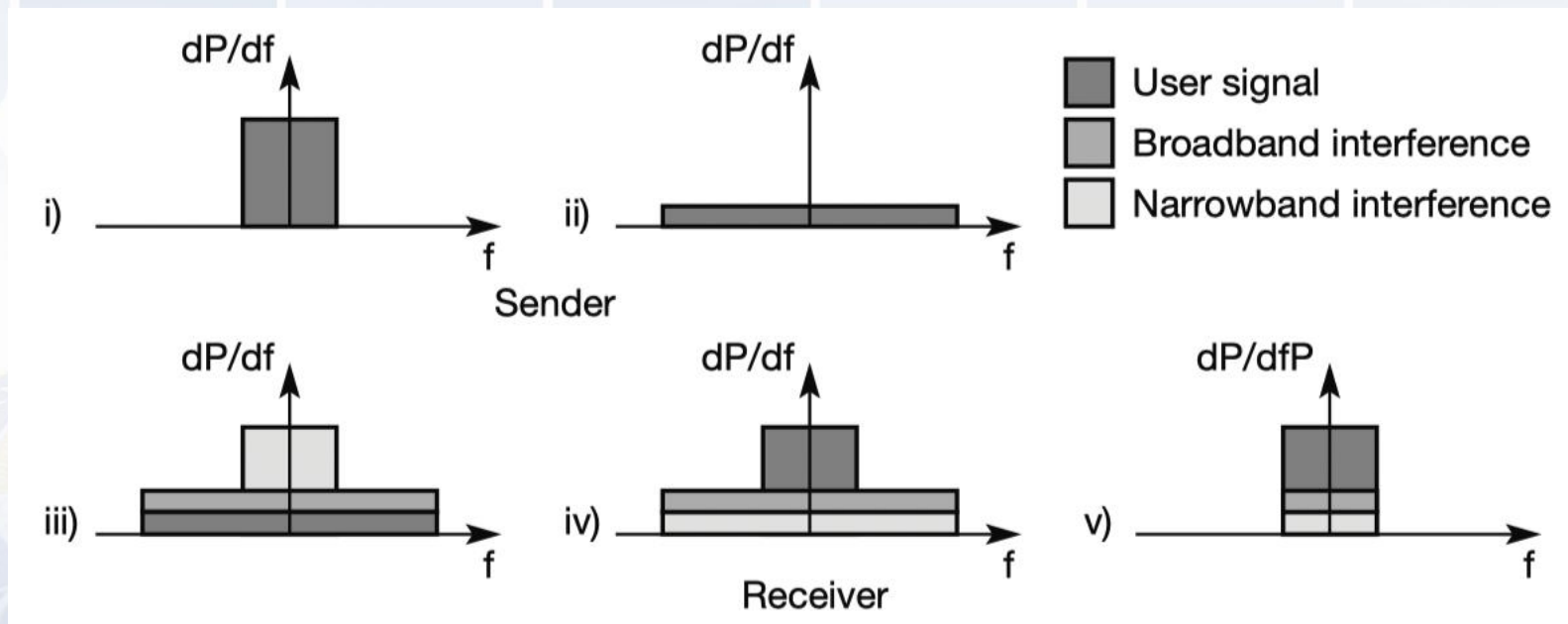
Frequency shift keying (FSK)



Phase shift keying (PSK)

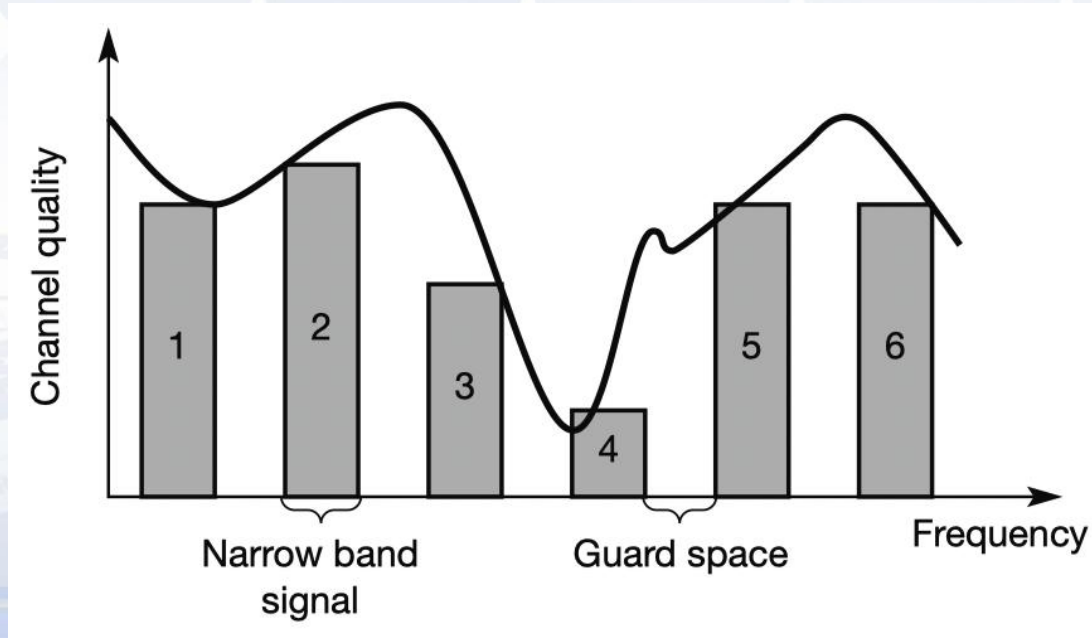
Spread spectrum

Spread spectrum techniques involve spreading the bandwidth needed to transmit data – which does not make sense at first sight.

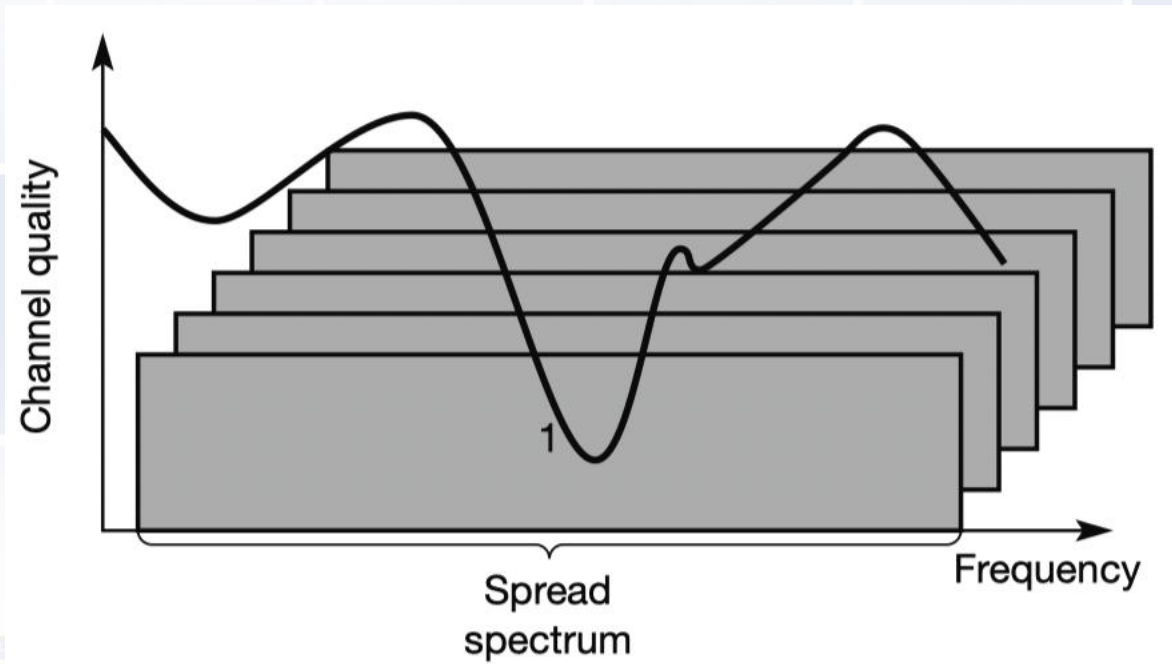


Spread spectrum

Spread spectrum can increase resistance to narrowband interference. All narrowband signals are now spread into broadband signals using the same frequency range.



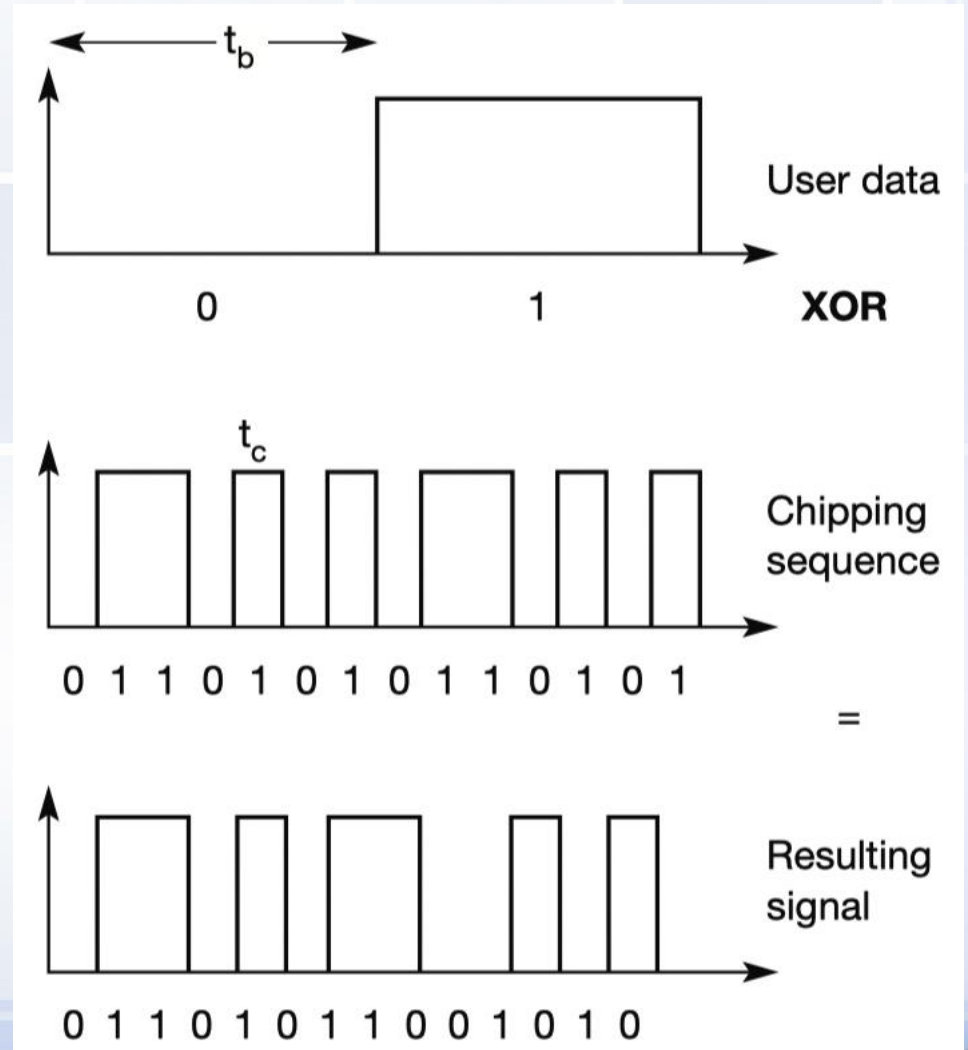
Spread spectrum



Spread spectrum to avoid narrowband interference

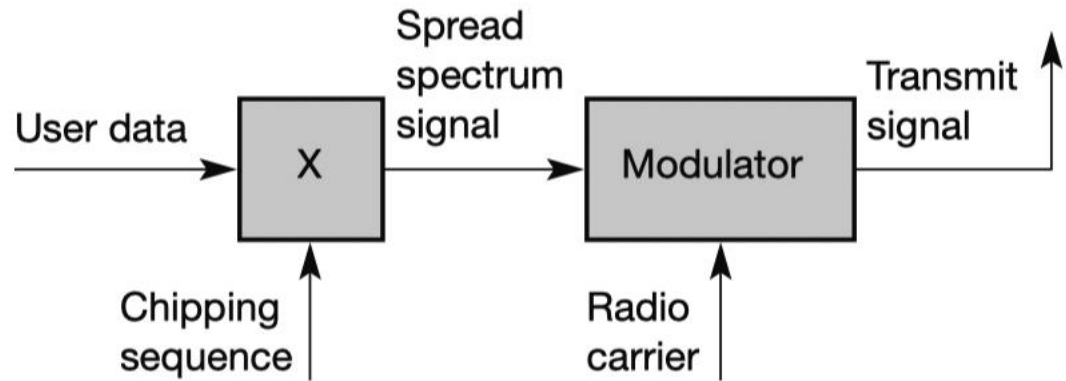
Direct sequence spread spectrum

Direct sequence spread spectrum (DSSS) systems take a user bit stream and perform an (XOR) with a so-called chipping sequence

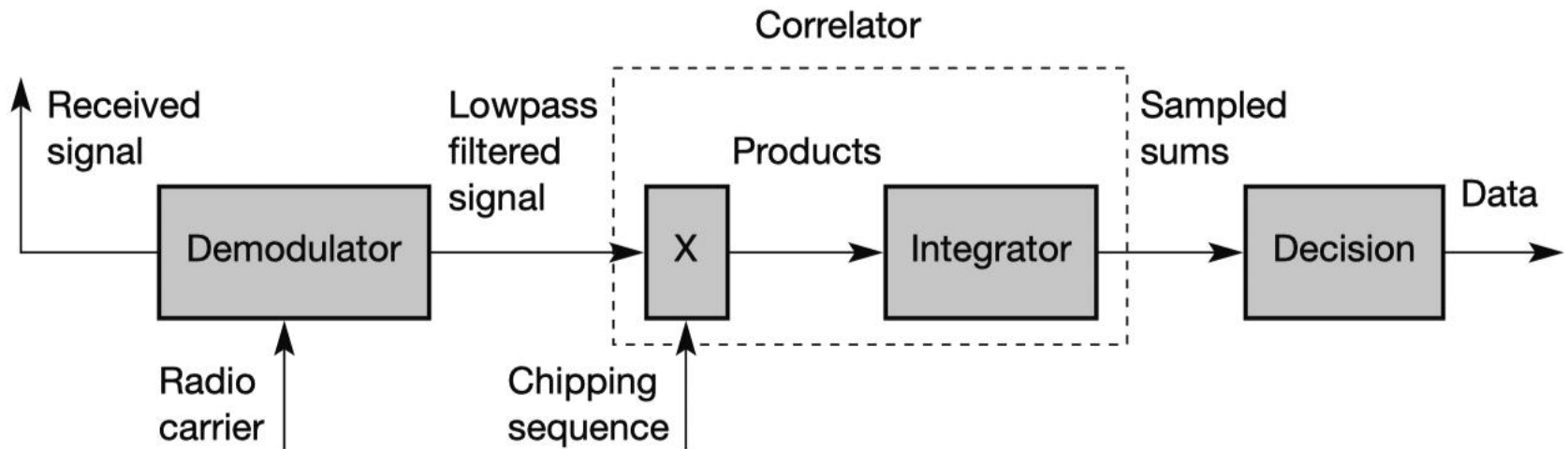


Direct sequence spread spectrum

DSSS Transmitter



DSSS Receiver



Tugas Mandiri (teori):

1. What are the main benefits of a spread spectrum system?
2. How can spreading be achieved?
3. How can DSSS systems benefit from multi-path propagation?.

Tugas Mandiri (praktikum):

Rancang sebuah node di Network Simulator.

end

