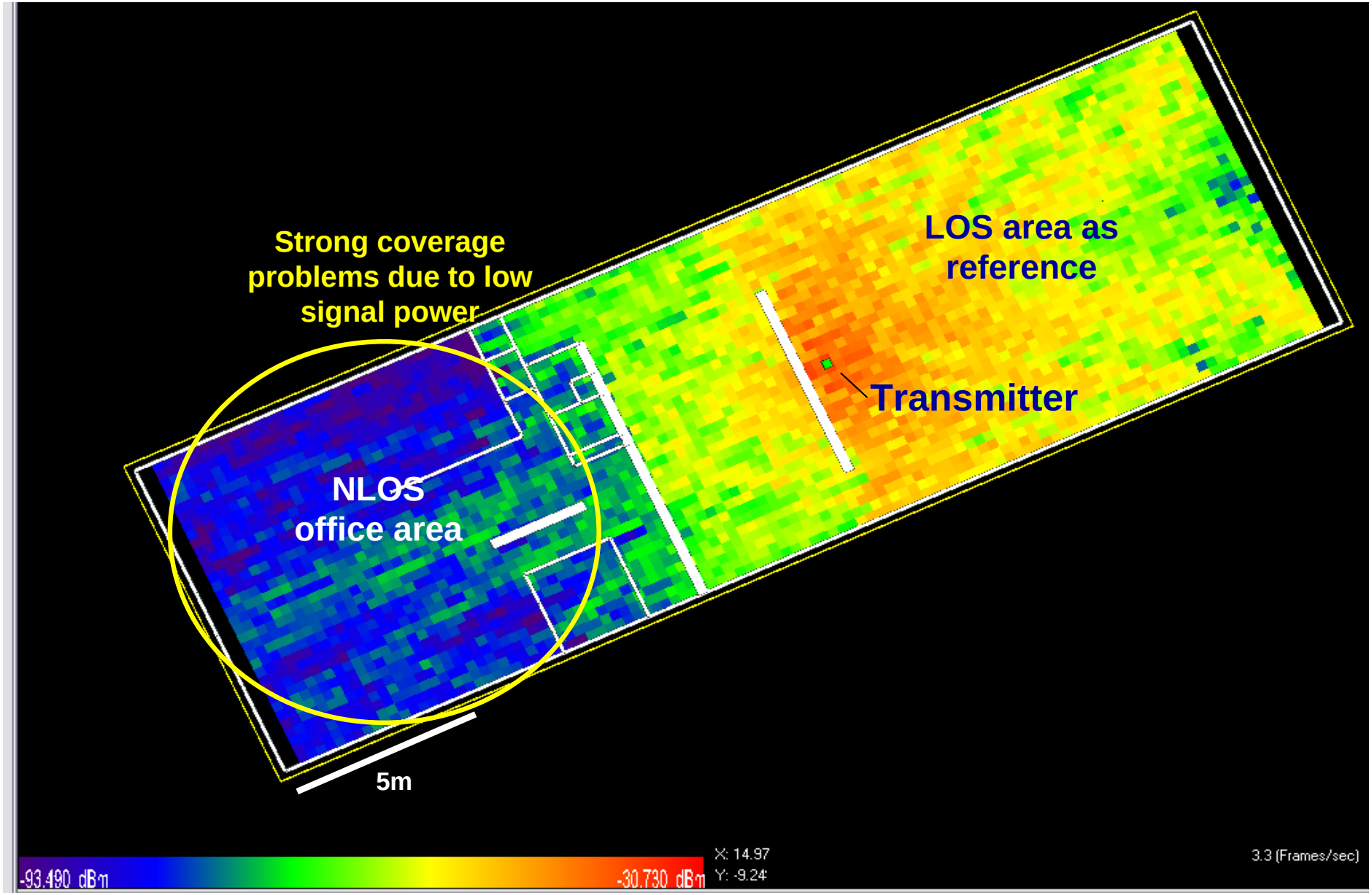
Enhanced Performance by Sub-1 GHz WSN Solutions based on IEEE 802.15.4-2006

PSSS enhancement of IEEE 802.15.4-2006 PHYs

Wireless trends

Typical Office Environment
IEEE 802.15.4 Transceiver 2.4 GHz, 250 kbps
Received Power in dBm



Typical Office Environment
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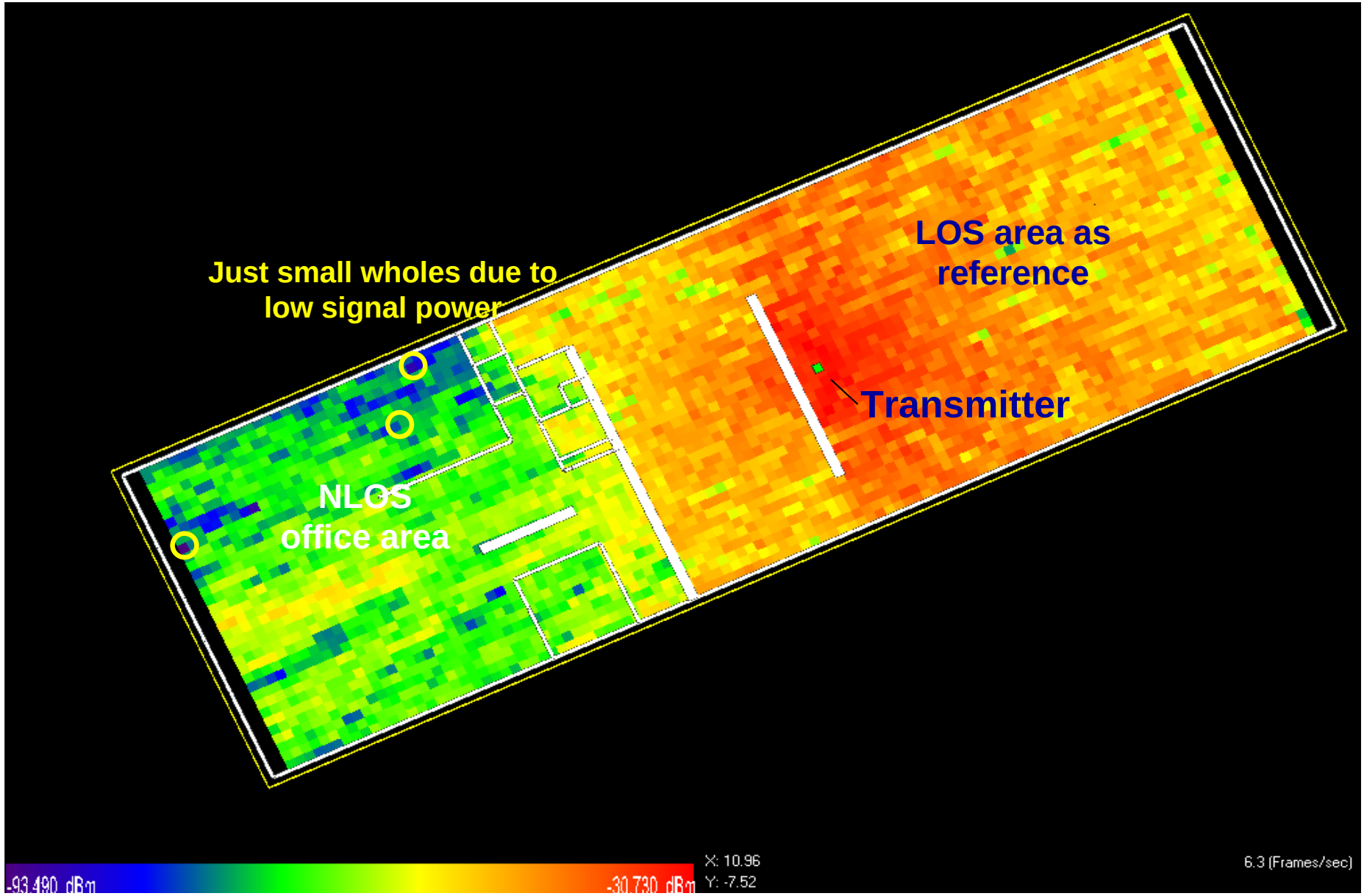
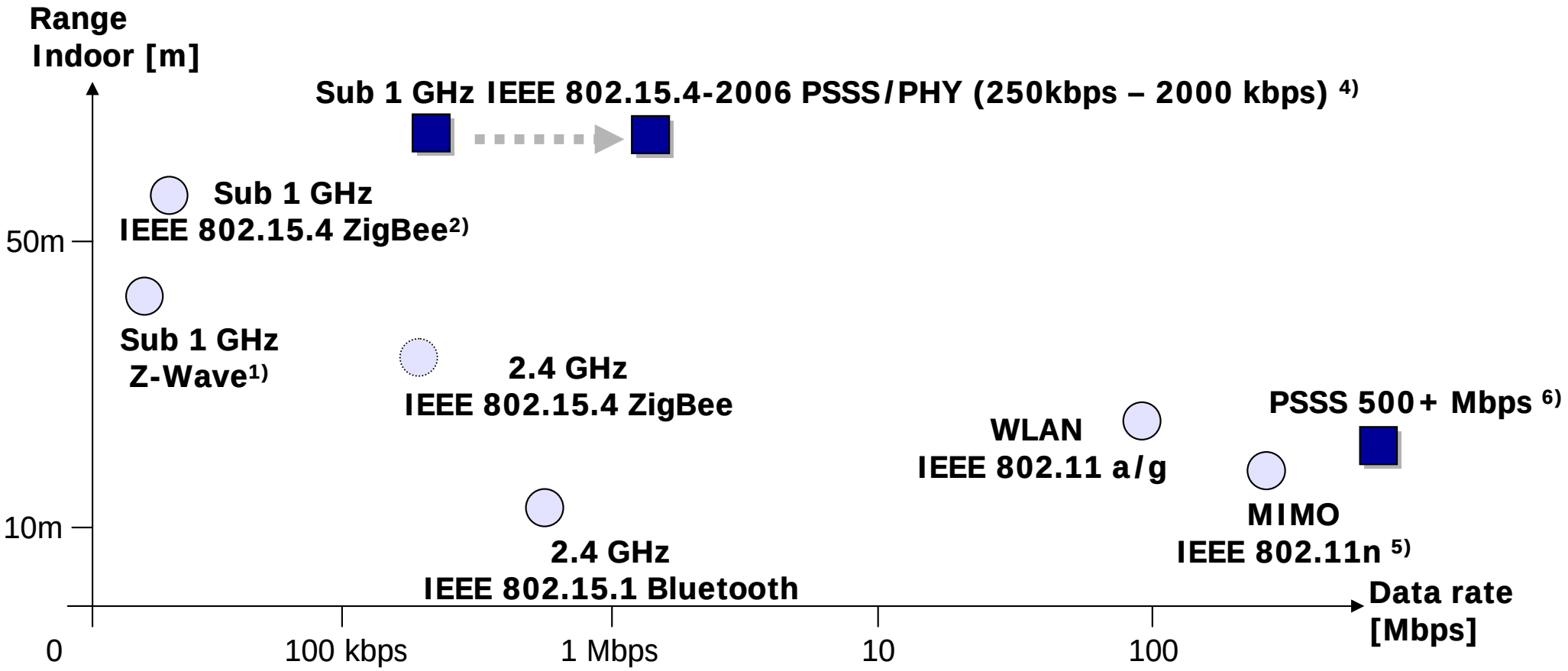


IEEE standards
Data rate vs. range

IEEE802.15.4-2006 PSSS/PHY solution improves existing wireless IC solutions from 20 kbps to 250 kbps – with performance modes up to 1000 kbps and even more. Avoids Interference to 2.4 GHz devices (WLAN, Bluetooth). PSSS - Parallel Sequence Spread Spectrum technology is developed and global patented by DWW.



1) Z-Wave FSK based 10/40 kbps EU/US. No IEEE Standard.
2) IEEE 802.15.4 868/915 MHz system 20/40 kbps EU/US.
3) In combination with OFDM (high complexity of IC).
4) 1 Mbps proprietary.
5) Draft IEEE Standard.
6) Factor 10 less complex (gate count) then Mimo OFDM. Could be build with today in mass markets available components.

Summary – Situation & Trends in short range wireless

- **IEEE802.11 will expand from wireless LAN to AV / CE applications**
  2.4 GHz will continue to be the dominant RF band in most markets.
- **WLAN interference is accepted as a REAL concern –**
  Sub-1-GHz standards provide winning alternatives to use of 2.4 GHz.
- **Don't expect ZigBee to succeed in the market –**
  But 802.15.4 and especially IEEE802.15.4-2006 (PSSS-PHY) will find their markets in industrial & commercial spaces.
- **Expect that TCP/IP will play a major role in sensor networks –**
  IPSO and IETF will dwarf all other TCP/IP related groups / attempts.
- **Z-Wave is a major player in home control**
  It will not loose against today's competitors – but it neither has won the game yet against new competitors.
- **Bluetooth will continue to be big around the mobile phone –**
  But who needs the various other Bluetooth variants?.
- **Watch out for low power WLAN in the future –**
  However, don't be mislead by marketing into unrealistic expectations.
- **Energy harvesting demands low energy consumption for data transmission –**
  However, again don't be mislead by marketing into unrealistic expectations.

- **Thank You**

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