LoRa Deep Dive

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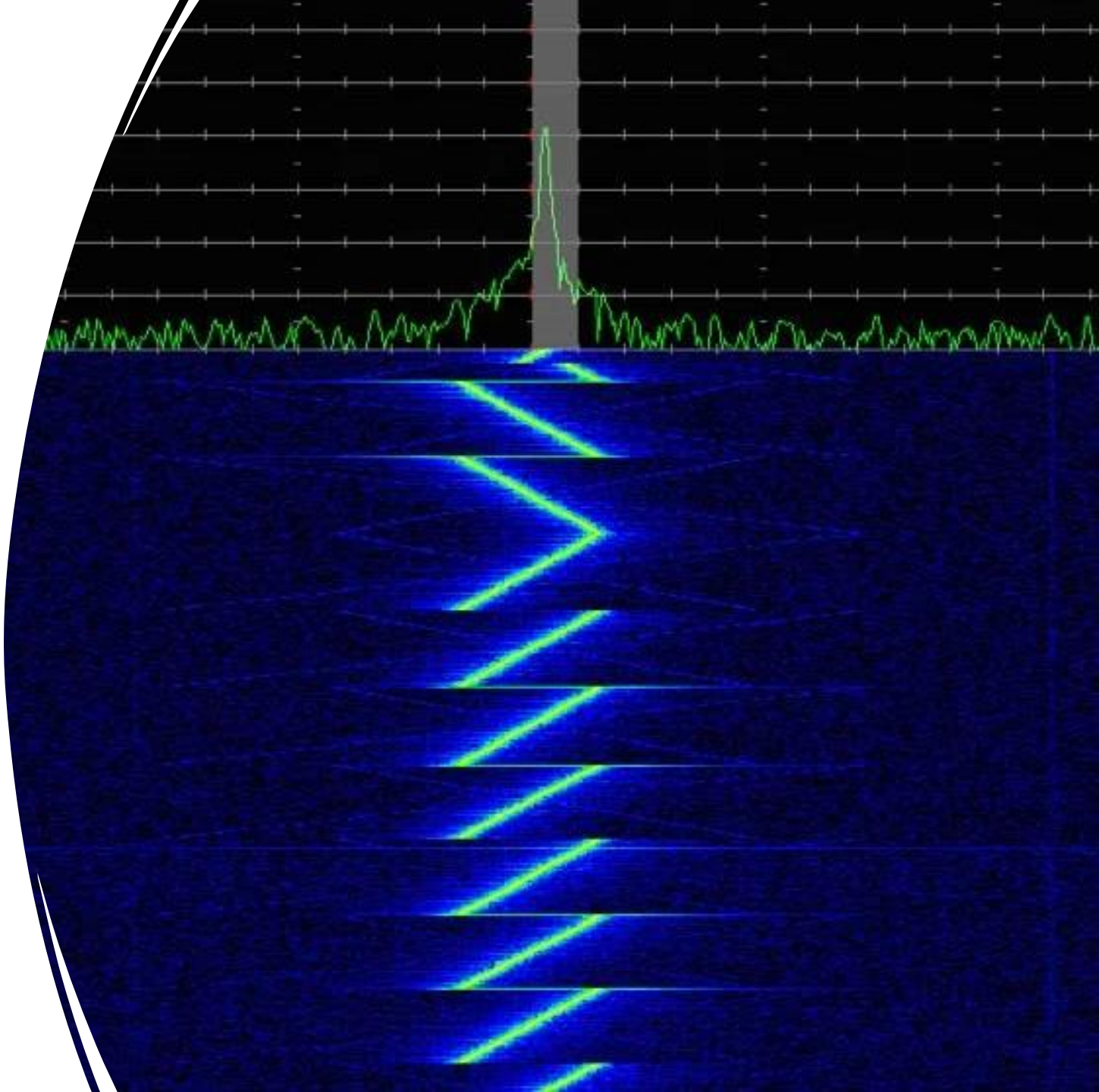
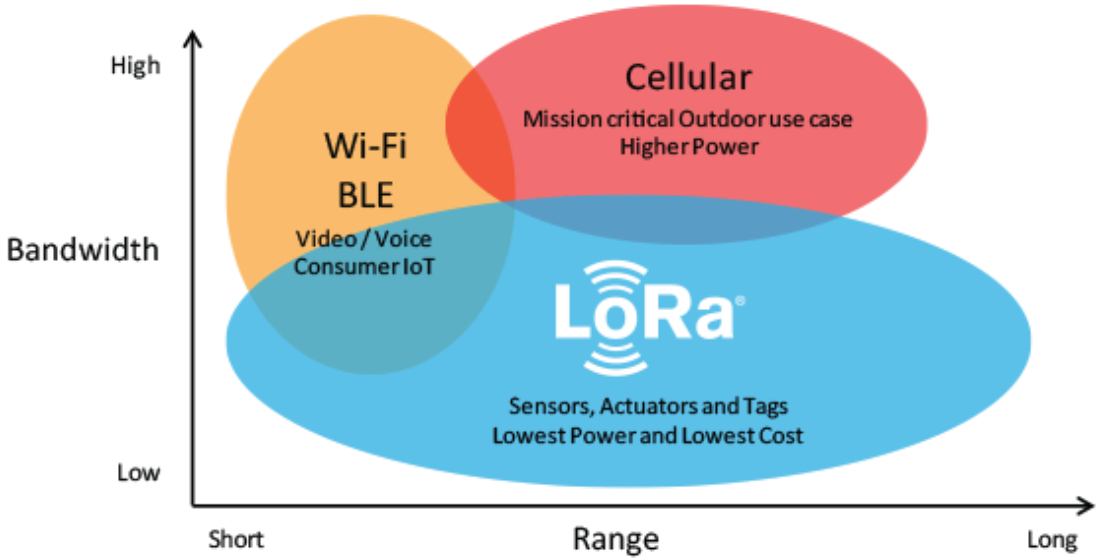
What is LoRa?

- LoRa is a chirp spread spectrum (CSS)
- Uses “upchirps” to communicate
- Has a spreading factor ranging between 7-12
- Bandwidth of 250 kHz and frequency band of 915 MHz
- LoRaWAN is the media access control for LoRa



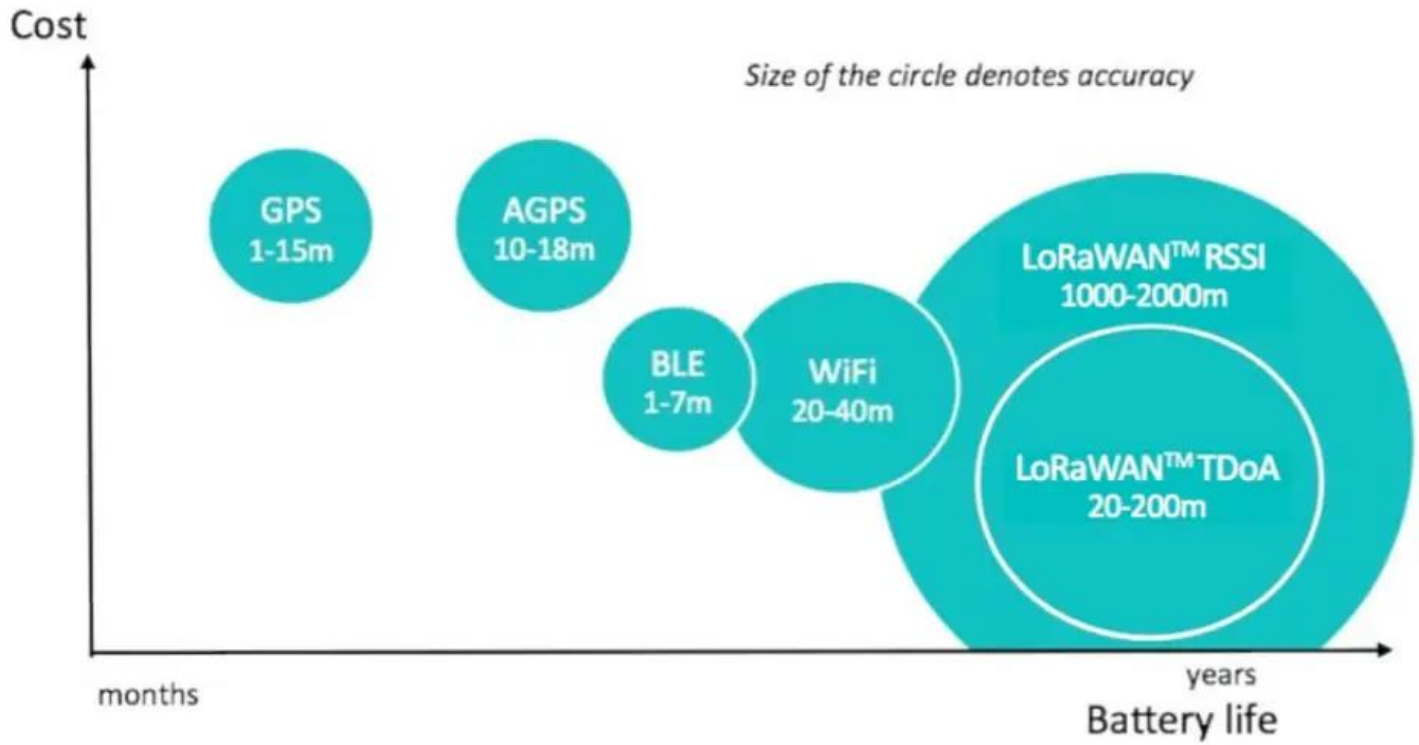
LoRa Range

- The maximum distance under perfect condition is currently 1336 km
- Under a city condition the range is estimated to be 2 km and in open area 10 km
- Capabilities to reach the moon



LoRa Location

- LoRa can track using LoRaWAN protocol
- The updates vary based on the increment wanted
- LoRaWAN TDoA geolocation requires 3 gateways



Strengths, Weaknesses, and Applications

Strengths: Versatility, Scalability, Battery efficiency, Range, Geolocation

Weakness: Low Data Rates, Shared Frequency Bands, Limited Bandwidth, Dependency on Gateways

Applications: Animal Conservation, Dementia Patients, Airport Tracking

Key Takeaways

- LoRa itself is a long-range, low-power communication system using a Chirp Spread Spectrum
- LoRaWAN adds what is needed to do more such as geolocation
- Spreading Factor will dictate the efficiency, sensitivity, and range
- There are uses like what we want with testing that is done in nearly the exact same process