WInnForum June 2024 US NSS Panel: The UWB Perspective

Benjamin A. Rolfe, UWB Alliance

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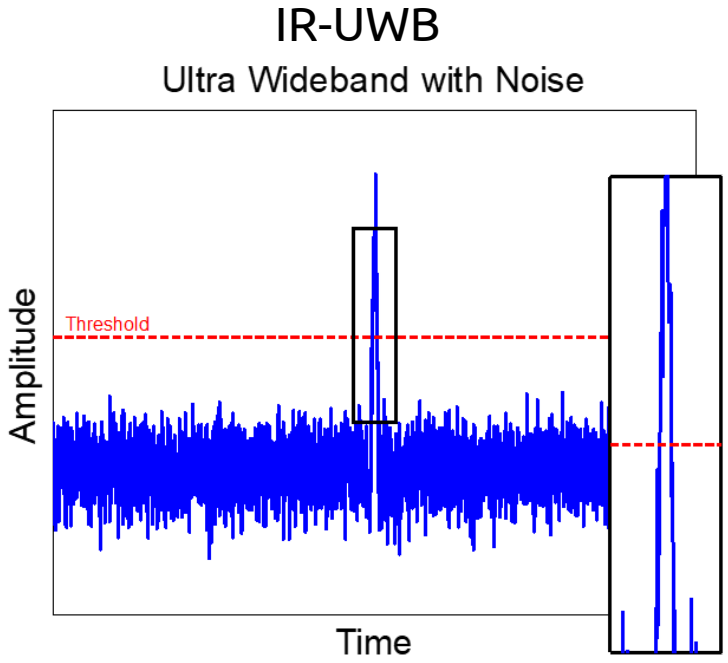
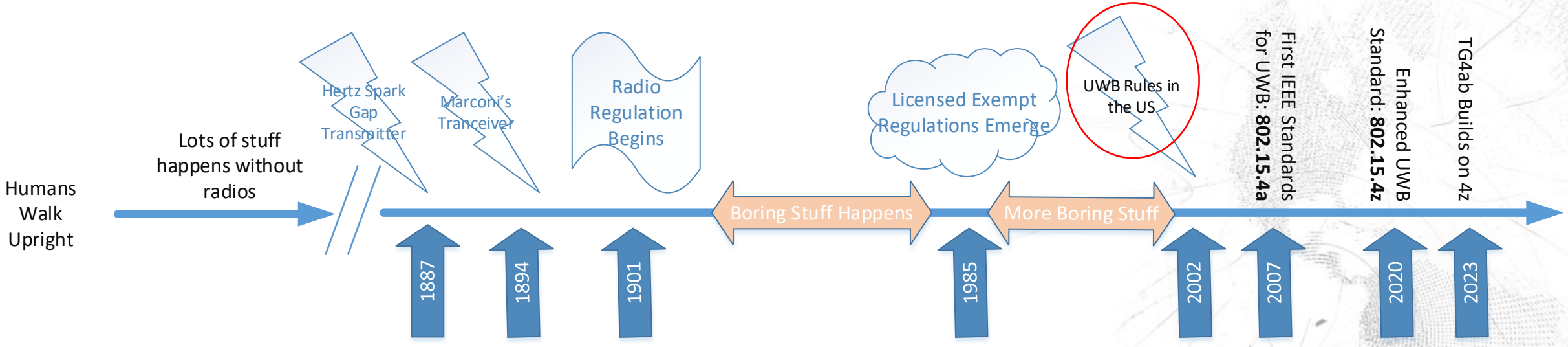
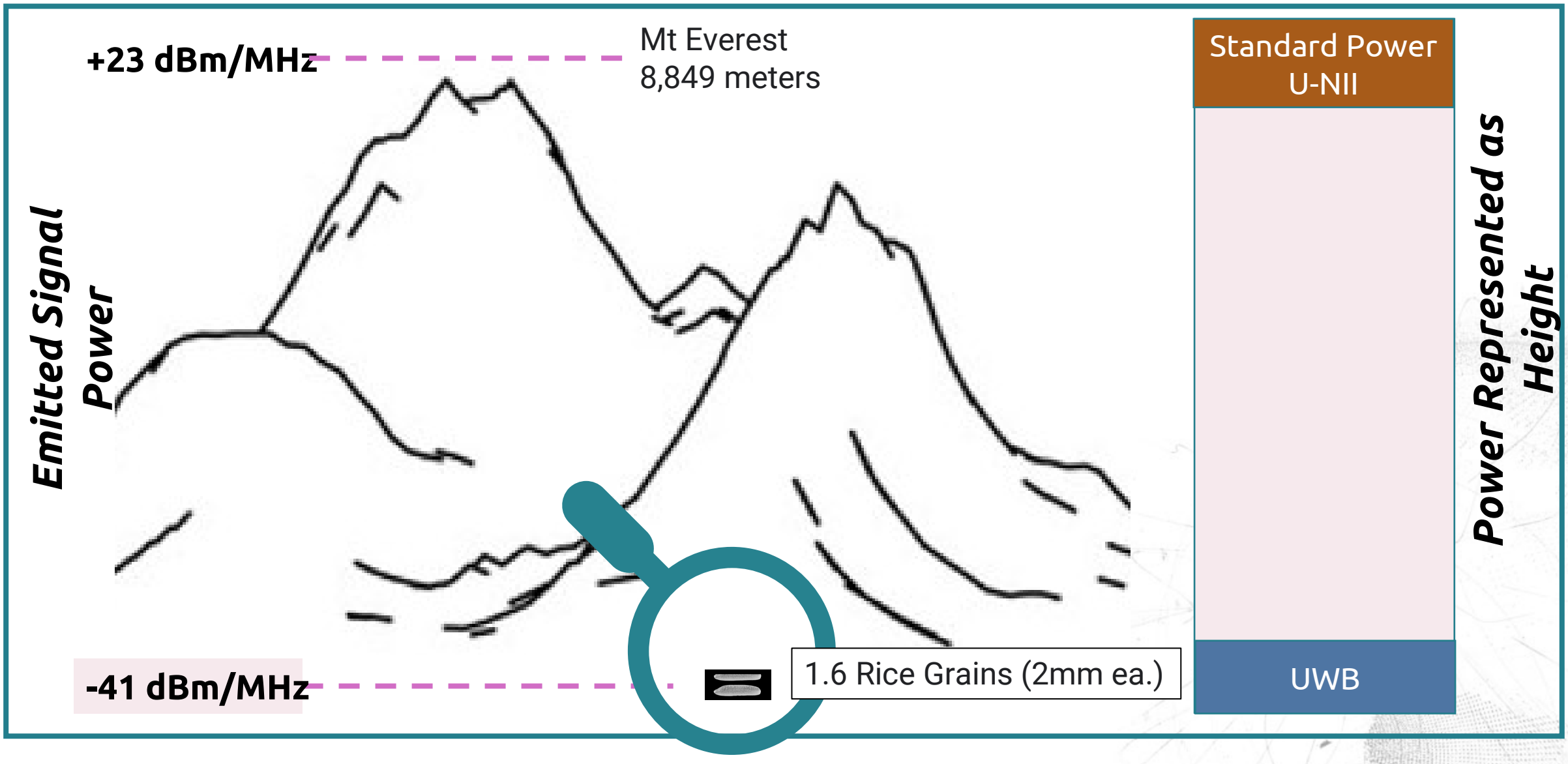
What is UWB: Innovation reaching back to Marconi



- Minimum occupied bandwidth of 500 MHz
- Short pulse < 2nS in short bursts (pulse per symbol)
- Unlicensed operating under many bands
  - 3.1 GHz to 10.6 GHz in North America (FCC Subpart F)
  - 6 GHz to 8.5 GHz almost everywhere
- Extremely low power
  - -41.3 dBm/ MHz PSD, -8 dBm max EIRP
- Inherently low impact and readily shares spectrum
- Another way to share spectrum (coexistence)



UWB is Quiet Compared to U-NII



UWB: Unlicensed access for decades you didn't notice

Example: Unlicensed access to the 6 GHz band

- Unlicensed use of the midband from 3.1 GHz to 10.6 GHz since 2002 (Subpart F, 2002)
- Expanded unlicensed use of the midband from 5925–7250 MHz (Subpart C, 15.250, 2005)
- Expanded unlicensed use of 6GHz band for higher power U-NII devices (Subpart E, 2020)

Something to include in consideration of mid-band usage.

UWB exists and is out there but you haven't noticed

Low impact – easy not to notice but widely used and rapidly growing!

Modest volume uses:

- Traditional localization applications (factory, industrial, medical, other)
- High rate communications (specialty applications e.g. military)

High volume: since 2019 expanding consumer uses

- In smart phones and connected devices
- Find things applications that really work
- Opening doors (Vehicles, Premises access)
- Point and go file transfer
- Sensing things (presence detection, heart rate and respiration rate monitoring, e.g. no child left behind)
- Low latency communications (HID, audio)

Topics for today (1)

Spectrum Pipeline and innovation

- When you dedicate it for one thing, more of the same, expanding use is hard
- What is innovation?

Collaboration is good

- Broader the better: Diversity in participation and use case is good
- Meaning of inclusive? Unprotected doesn't mean not important

Spectrum access

- Consider more than the traditional models of sharing
- Multiple sharing models available, many have a use
- An R&D plan should include multi-level innovation

Topics for today (2)

How do we define “efficient” use of spectrum?

- Diversity of uses is an important metric for the future
- Simultaneously using for more than one thing is more efficient than one at a time

Sharing models

- Traditional non-sharing: It’s mine and you can’t play with it
- Sharing by avoidance: in time, frequency, geography: you get a turn
- Sharing by coexistence: We can play together
  - Traditional unlicensed (LBT): avoidance at a finer time scale
  - Co-use: ability for two radios to transmit and not annihilate each other

More details: Current apps and emerging uses

- AirTags and SmartTags
- Digital Keys
- Contact Tracing
- Indoor Keyless Access Control
- Child Detection in Hot Cars
- Lossless Audio
- Tap-Free Mobile Payment
- AR & VR Positional Awareness
- Production Tool Tracking
- Medical Equipment Tracking
- Human Presence Detection
- Elder Fall Detection
- Baby Monitors
- IoT Device Tracking
- Indoor Navigation
- Ticket Validation
- In-Vehicle Payment
- File Transfer via Smart Phones

Thank You!

Benjamin Rolfe, CTO
Ben@UWBAlliance.org