

Spectrum Monitors Can't Monitor Spectrum

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International Symposium on Advanced Radio Technology
2 August 2016

Why do we monitor spectrum?

Purposes: (incomplete list)

- To decide if a new system can operate in that band & area
- To discover the source of interference
- To provide information needed to engineer radio networks

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A network of spectrum monitors will accomplish **NONE** of these purposes *

** in bands that use state-of-the-art or future radio technologies*

Key challenges for spectrum monitors

A spectrum monitor is:

- A dedicated, generic device
- Not co-located with receivers operating in the band
- Performing energy detection

Fitness for purpose depends on assumptions

- When a spectrum monitor detects energy, the channel is in use.
- When a channel is in use, a spectrum monitor will detect energy.
- The energy level in a band correlates to impact on receivers.

These assumptions are **INVALID** for emerging technologies.

- Directional antennas
- MIMO communications
- Adaptive waveforms and signal processing

Monitoring spectrum without spectrum monitors

Multiple approaches should be explored & used.

- Detectors specific to emitting or receiving systems
- Peer-to-peer measurements
- Probing transmitters

The national spectrum monitoring infrastructure will be a federation of heterogeneous collection systems.

- Interconnection standards and support are critical.
- Metadata will be a major challenge.
- Recommend tasking a federal organization to handle these issues.