Model-Based Spectrum Management

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Proposed modeling constructs

- Maximum power density
- Spectrum mask
- Underlay mask
- Power map
- Propagation map
- Intermodulation masks
- Platform
- Location
- Start time
- End time
- Minimum power density
- Protocol or policy

Can capture unique characteristics of spread spectrum systems
Can capture antenna effects
Can capture environmental effects
Captures susceptibility to intermodulation
Enable greater resolution in spectrum management
Can capture behaviors that enable compatible reuse

Not data about a system but used to build a model of spectrum use
Models are information!
Combining constructs into models

Modeling constructs are found in transmitter and receiver models and in system and collection headings

Constructs define emissions

Constructs define interference

Proposal provides an XML schema for this type of model construction
Spectrum Consumption Modeling as a Loose Coupler

Network Operations and Spectrum Management

Spectrum Management Diversity

SCM

(loose coupler)

Spectrum Use Diversity

RF Coexistence and Dynamic Spectrum Access

Innovation

Standardization

Channel configuration

DSA policy

Spectrum use
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Model and Collection Functions

- System Model
  - Constructs in heading define the boundaries of system operation
  - Lists transmitter and receiver models with more limiting constructs

- Collective Consumption Listing
  - Constructs in heading define the limits to which the collection is complete
  - Lists systems, transmitters and receivers of spectrum consumers that consume spectrum within the limits of the collection

- Spectrum Authorization Listings
  - Constructs in the heading define the limits of the overall authorization
  - The lists of system, transmitter, and receiver models identify available spectrum

- Spectrum Constraint Listings
  - Constructs in the heading define the limits of the collection of constraints
  - The lists of system, transmitter, and receiver models identify existing uses of spectrum that have precedence