

Shared Spectrum Company Spectrum Occupancy Reports

Spectrum Occupancy Measurements: Loring Commerce Centre, Limestone, Maine, September 18-20, 2007, Shared Spectrum Company Report (2007), available online at http://www.sharespectrum.com/measurements/download/Loring_Spectrum_Occupancy_Measurements_v2_3.pdf.

Spectrum Occupancy Measurements: Dublin, Ireland, Collected On April 16-18, 2007, Shared Spectrum Company Report (2007), available online at http://www.sharespectrum.com/measurements/download/Ireland_Spectrum_Occupancy_Measurements_v2.pdf.

Spectrum Occupancy Measurements: Chicago, Illinois, November 16-18, 2005, Shared Spectrum Company Report (2005), available online at http://www.sharespectrum.com/measurements/download/NSF_Chicago_2005-11_measurements_v12.pdf.

Spectrum Occupancy Measurements, Location 1 of 6: Riverbend Park, Great Falls, Virginia, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

Spectrum Occupancy Measurements, Location 2 of 6: Tyson's Square Center, Vienna, Virginia, April 9, 2004, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

Spectrum Occupancy Measurements, Location 3 of 6: National Science Foundation Building Roof, April 16, 2004, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

Spectrum Occupancy Measurements, Location 4 of 6: Republican National Convention, New York City, New York, August 30, 2004 - September 3, 2004, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

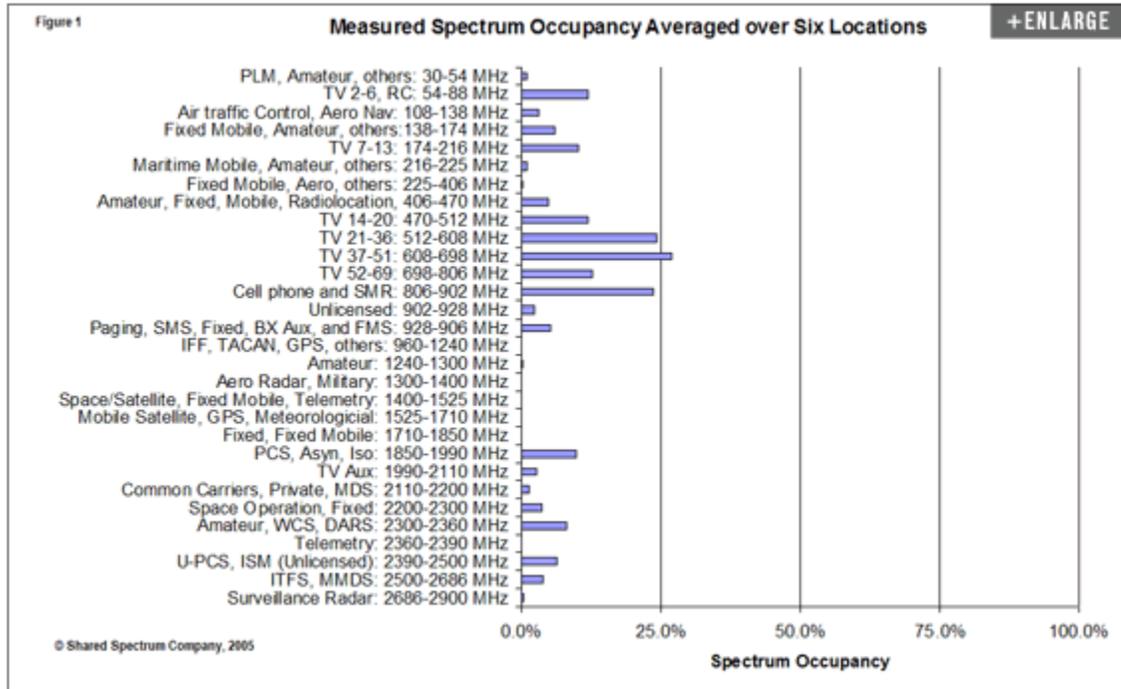
Spectrum Occupancy Measurements, Location 5 of 6: National Radio Astronomy Observatory (NRAO), Green Bank, West Virginia, October 10 -11, 2004, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

Spectrum Occupancy Measurements, Location 6 of 6: Shared Spectrum Building Roof, Vienna, Virginia, December 15-16, 2004, Shared Spectrum Company Report (2005), available online at <http://www.sharespectrum.com/measurements/>.

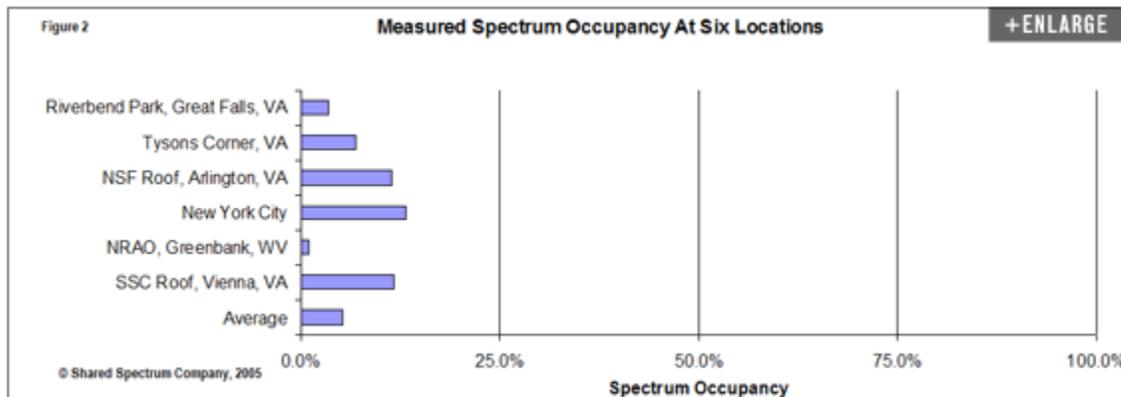
Shared Spectrum Company Spectrum Occupancy Study Results

The bar graphs below provide the average of the occupancy in each band (Figure 1) and at each of the 6 locations (Figure 2).

Spectrum occupancy in each band averaged over six locations



Spectrum occupancy at each location



Shared Spectrum Company Reply Comments – Exhibit A

SSC's spectrum observatory system has been implemented in connection with a project funded by a National Science Foundation award (CNS 0722003) to the Illinois Institute of Technology (IIT), to which SSC is a subcontractor. One observatory system was stood up at IIT in Chicago, IL, during the first quarter of 2008 and another one is implemented on the rooftop of SSC's office building in Vienna, VA (in the Washington, DC metropolitan area).

The spectrum observatory consists of two dish antennas installed on the mechanical room penthouse on SSC's office building. These antennas cover 25 MHz – 3000 MHz. The spectrum measuring system uses a pre-selector along with a spectrum analyzer and customized software for the gathering and analysis of spectrum data.

Below are representative plots of the spectrum measurements made across the specified bands during the Presidential Inauguration events in January 2009. Data collection started on January 19, 2009 and continued non-stop for approximately 74 hours. The resolution bandwidth was set to 10 kHz for this set of measurements. Various detection threshold values from -120 to -90 dBm were used to analyze spectrum holes. The plotted spectrum data was calibrated to the power level at the antenna input using the following procedure:

- The recorded power levels measured by the spectrum analyzer are provided in dBm relative to the analyzer input.
- The difference between the power level at the analyzer input and the power level at the antenna input is due to the losses and gain of the RF cables, filters, and amplifiers associated with the preselector.
- To correct for this difference, the preselector loss was measured using a network analyzer in each spectrum band at the conclusion of the measurements.
- The preselector loss versus frequency data values (in dB) were then added to the measured values (via an interpolation process) when plotting the spectrum data.

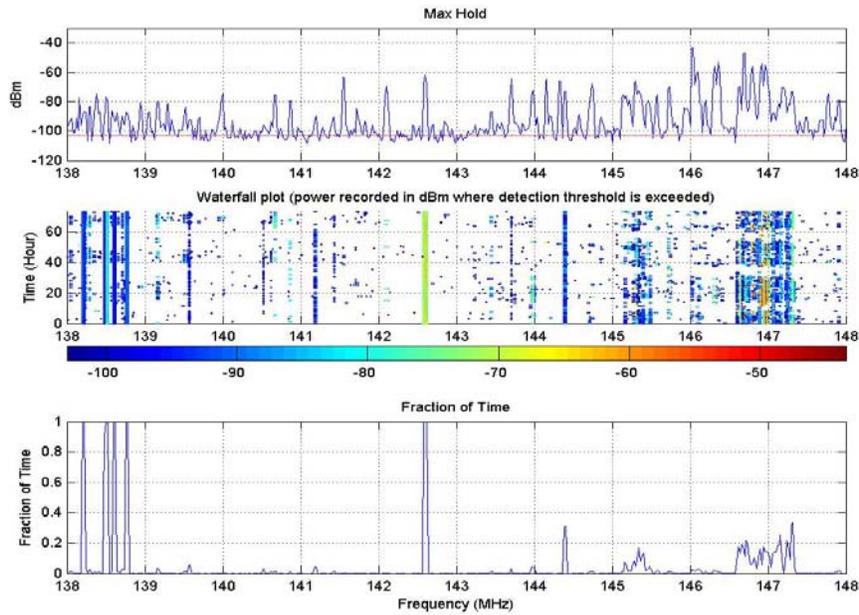
Three types of plots were generated at the end of data analysis:

The first subplot represents the maximum power value versus frequency measured during the period. The time shown on the plot is the measurement start time.

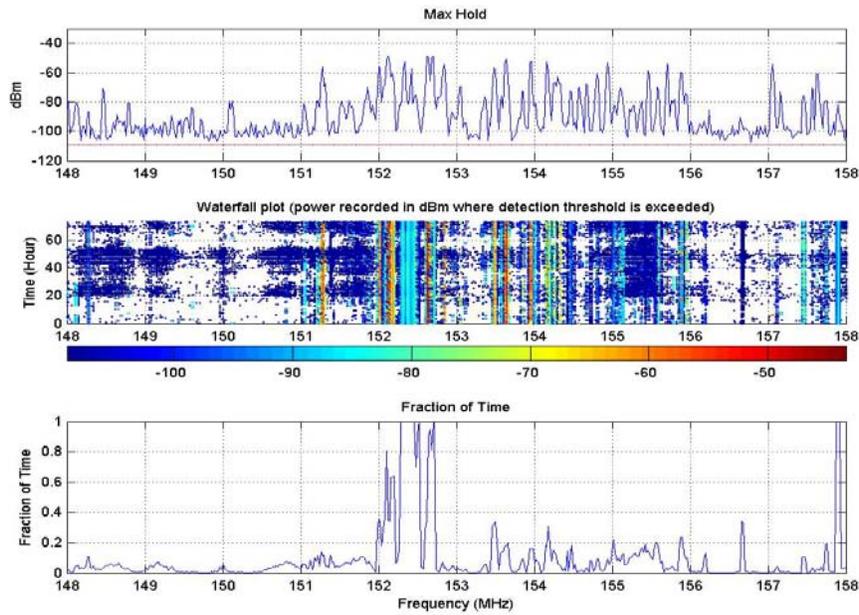
The second subplot is a waterfall-type of plot showing occupancy versus time and frequency. Occupancy is determined when the power level exceeds a threshold. The threshold value was selected for each run, and is shown as a dotted line on the upper subplot.

The third subplot is the fraction of time the signal was detected, versus the frequency measured during the period. If the fraction of time is '1', it means that the signal was detected during the entire period of measurement collection.

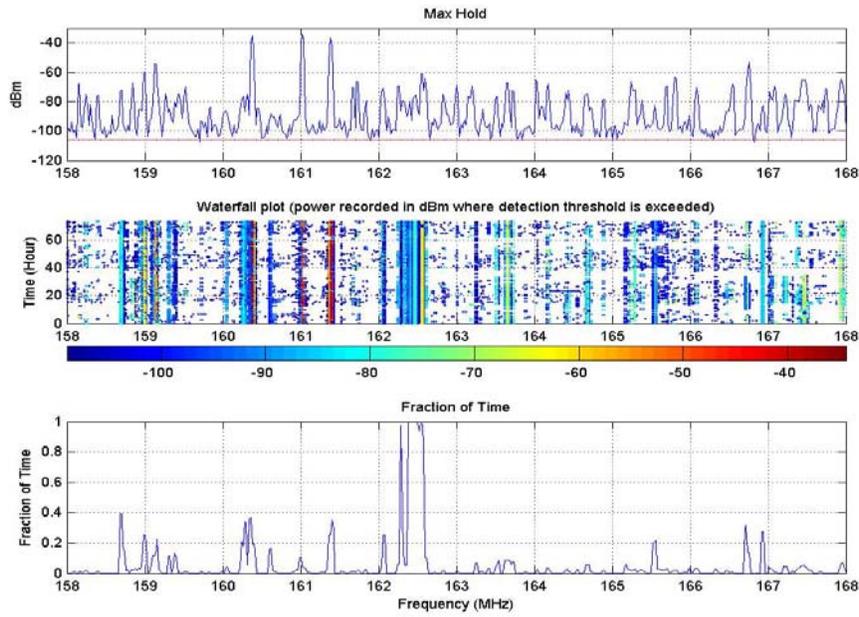
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:02:43.



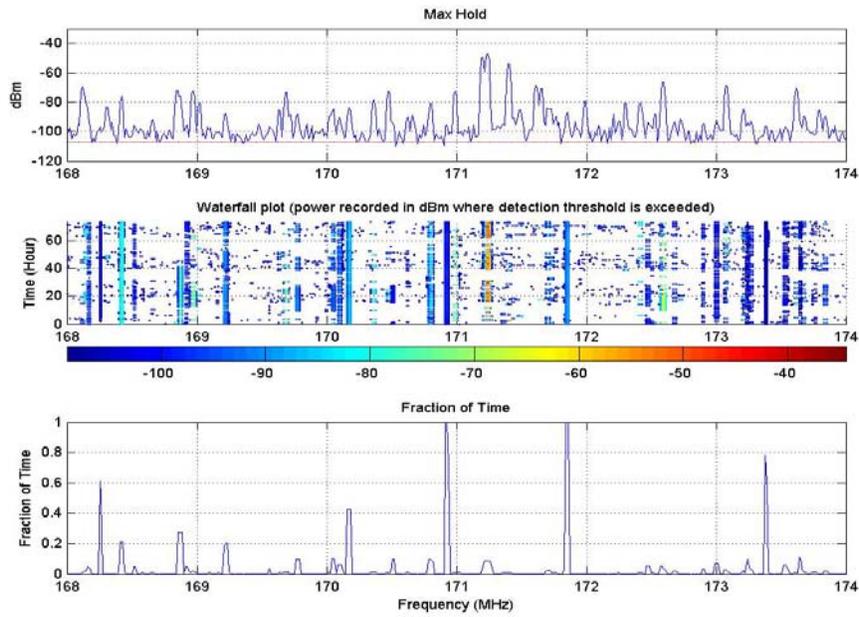
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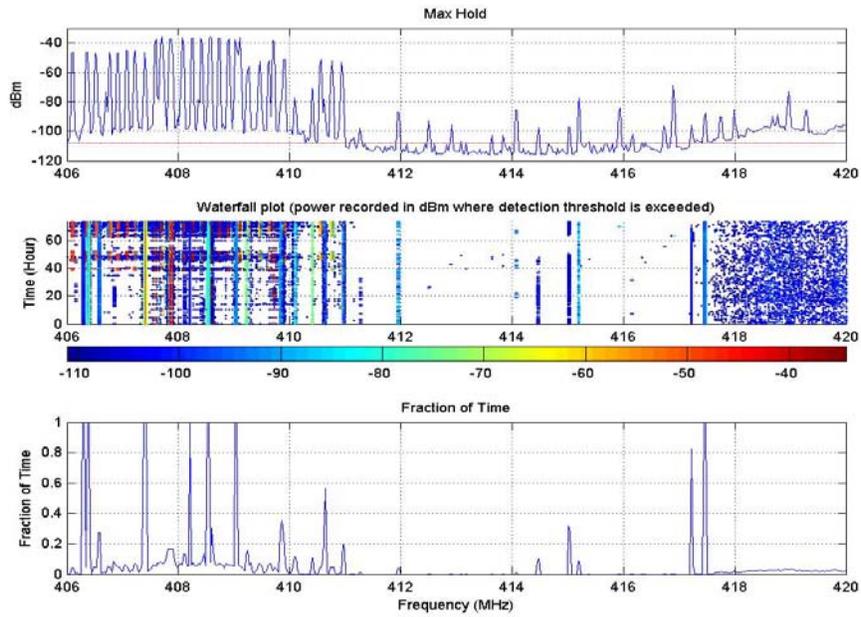
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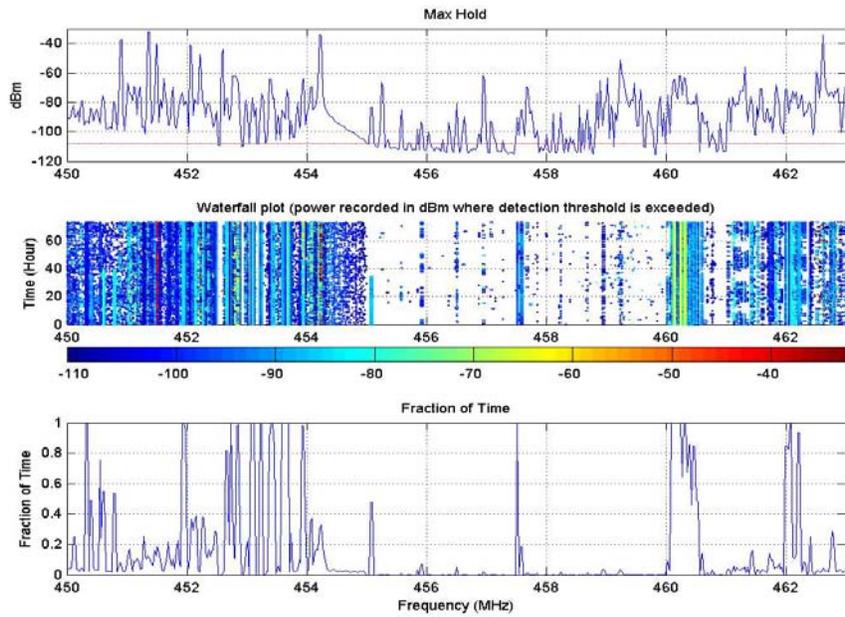
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:03:02.



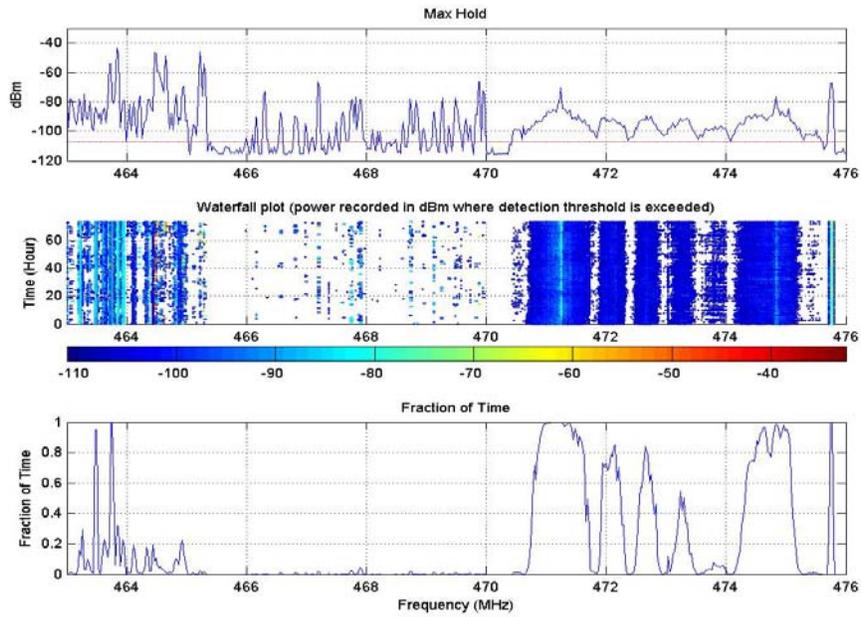
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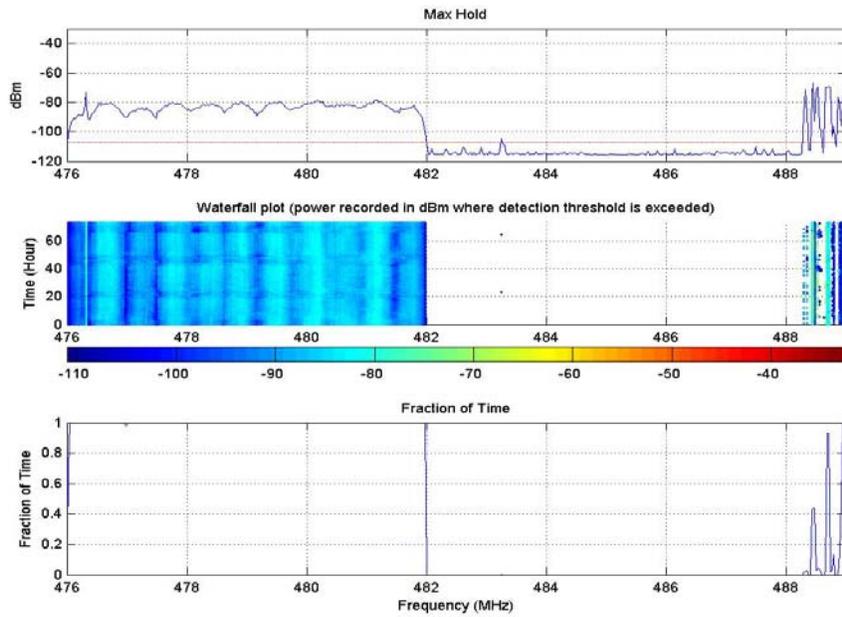
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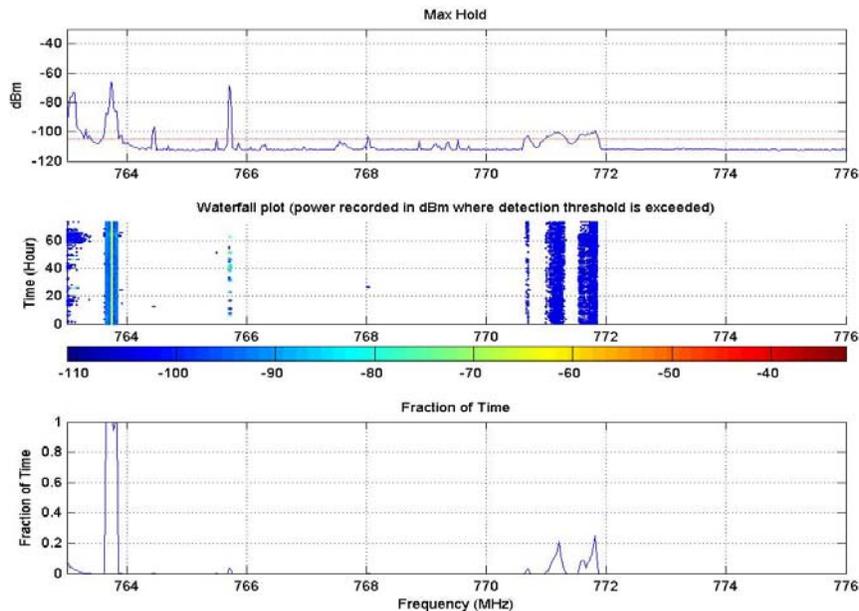
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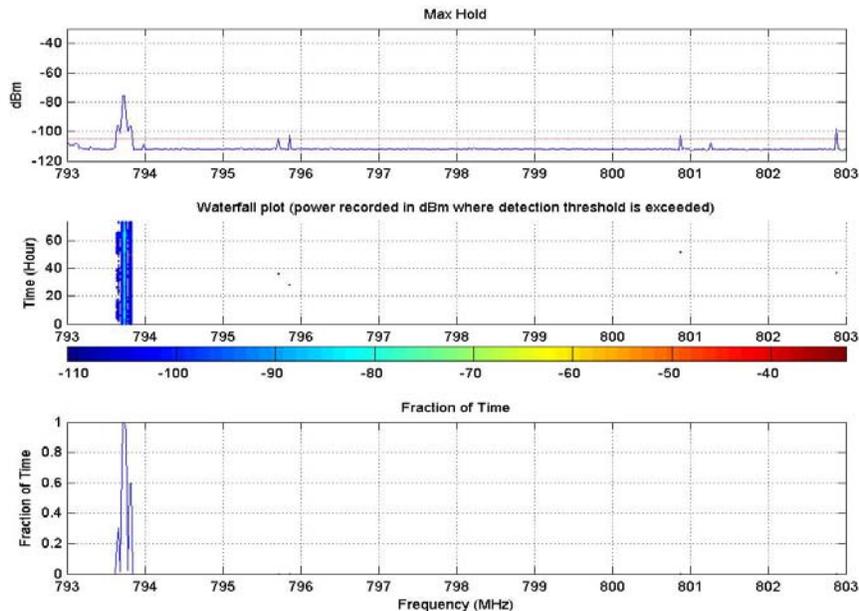
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:03:38.



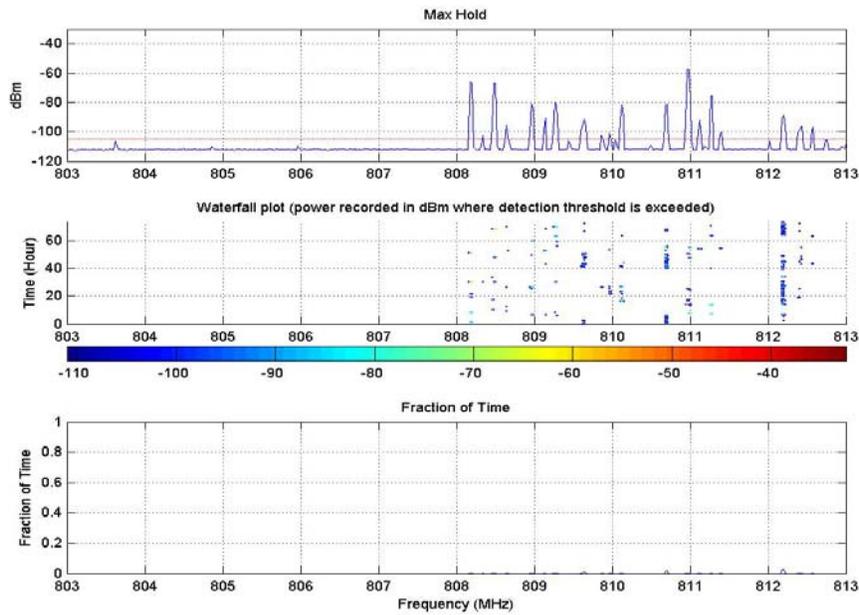
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:00.



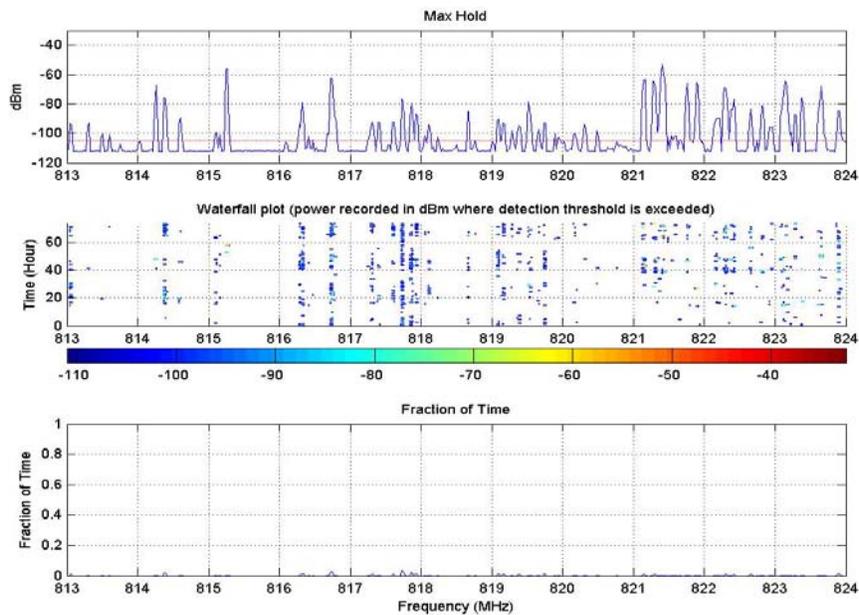
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:07.



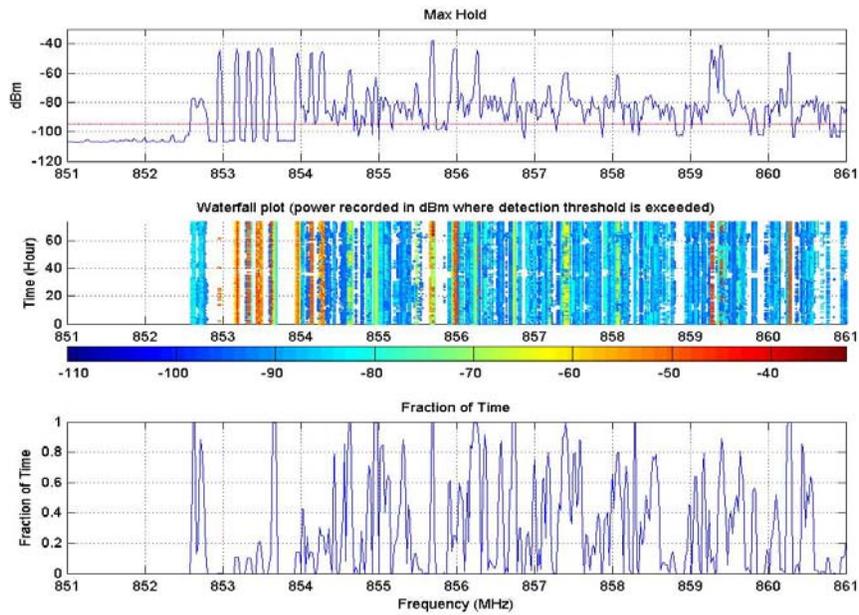
SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:14.



SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:21.



SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:28.



SSC Rooftop Measurements Collection- Start: 19/Jan/2009, 15:24:43. Stop: 22/Jan/2009, 17:04:35.

