

Telecommunications Computations with SPLAT

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Abstract—SPLAT is a very powerful tool licensed with GPL version 2, developed by John Magliacane (KD2BD) that can help to telecommunication engineers to work with the calculations in the telecommunication field. SPLAT can use the SRTM digital elevation models resulting from Radar Topography Mission Space Shuttle STS-99, and for the calculations of coverage area. It can use the Longley-Rice Irregular Terrain model as well as the Irregular Terrain With Obstructions (ITWOM v3.0) model. SPLAT is a flexible tool that can easily meet the requirements of telecommunications engineers and the rules and regulations of each country.

I. INTRODUCTION

Mathematical modeling is an important tool that allows engineers and telecommunications specialists predict the coverage area over a geographical area of interest.

This requires, in general, to trace a radiolink from the point of origin of information, up the hill from which the signal will be issued to the geographical area of interest and then calculate the coverage area.

Engineering calculations for the coverage area, are based on the recommendations of ITU (International Telecommunication Union) and use the charts on the basis of experimental curves developed by the United Nations agency to determine the coverage area, considering the antenna height over the average terrain and the irregularities of the same.

Telecommunications engineers should be adopt topographical profiles from the physical maps to determine the height above average terrain, the degree of irregularity of the terrain and the terrain clearance angle for these data and with the corresponding curves, build the predicted coverage area.

SPLAT (Signal Propagation, Loss, And Terrain analysis tool) is a tool licensed with GPL version 2, developed by John Magliacane (KD2BD) to calculate telecommunications, to use the SRTM digital elevation models result from Radar Topography Mission Space Shuttle STS-99. These digital maps are available for most populated regions on earth.

For the calculations of coverage it can use the mathematical model from the Longley-Rice Irregular Terrain model as well as from the Irregular Terrain With Obstructions (ITWOM v3.0) model.

This tool is based on coordinates WGS-84 or NAD83 and considers all the parameters that the telecommunications engineer requires to perform its calculations. Among its major features are the ability to:

- Survey topographic profile between two given coordinates
- Calculate the Fresnel zone between two given coordinates
- Calculate attenuation of field strength between two given coordinates

- Calculate the coverage area from one or more transmission sites
- Identify interference areas
- Draw color zones related to field strength or attenuation in dB
- Use directive antennas
- Compute overlapping coverage areas with Google Earth
- Computer overlapping coverage areas with Xastir

SPLAT is a tool that runs on a command line terminal and is fully documented on its website, where you can download the source code and manuals in English and Spanish (<http://www.qsl.net/kd2bd/splat.html>).

It can be installed by compiling the source packages or by program managers such as apt-get or synaptic:

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sudo apt-get install splat
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Additionally I have developed a web interface in php, using the ability of this language to execute shell commands behind the php page. This graphical interface requires that splat is already installed and can be run from the command line. Additionally you need apache, php and a few libraries. The documentation to install the interface can be found on this blog: <http://charlesescobar.com/?p=31>

Figure 1 shows the topographic profile and Fresnel zone between two geographical points

Fig. 1. Topographic profile and Fresnel Zone between two points

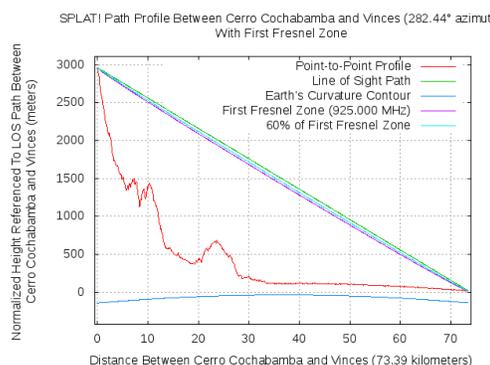


Figure 2 shows the coverage area prediction from a transmission site

SPLAT is a flexible tool that can easily meet the requirements of telecommunications engineers and the rules and regulations of each country.

Fig. 2. Coverage area prediction

