ITU World Radiocommunication Seminar

PFD Mask Viewer

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The tool

PFD Mask Viewer

Tool for visualizing PFD masks used in EPFD analysis

Mask provided in xml format (ITU-R S.1503-3)

Only PFD mask, no EIRP

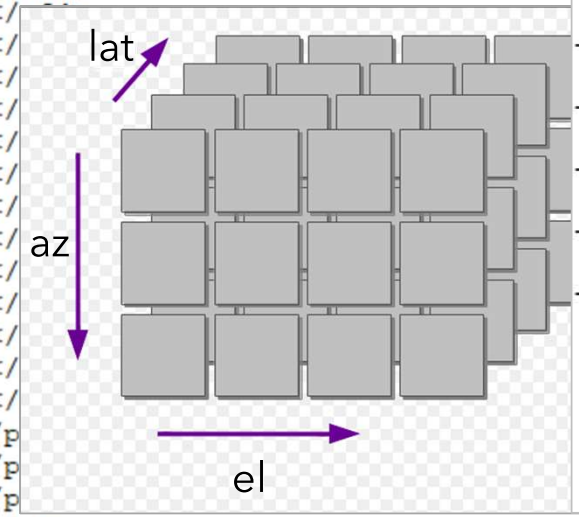
Types of mask:

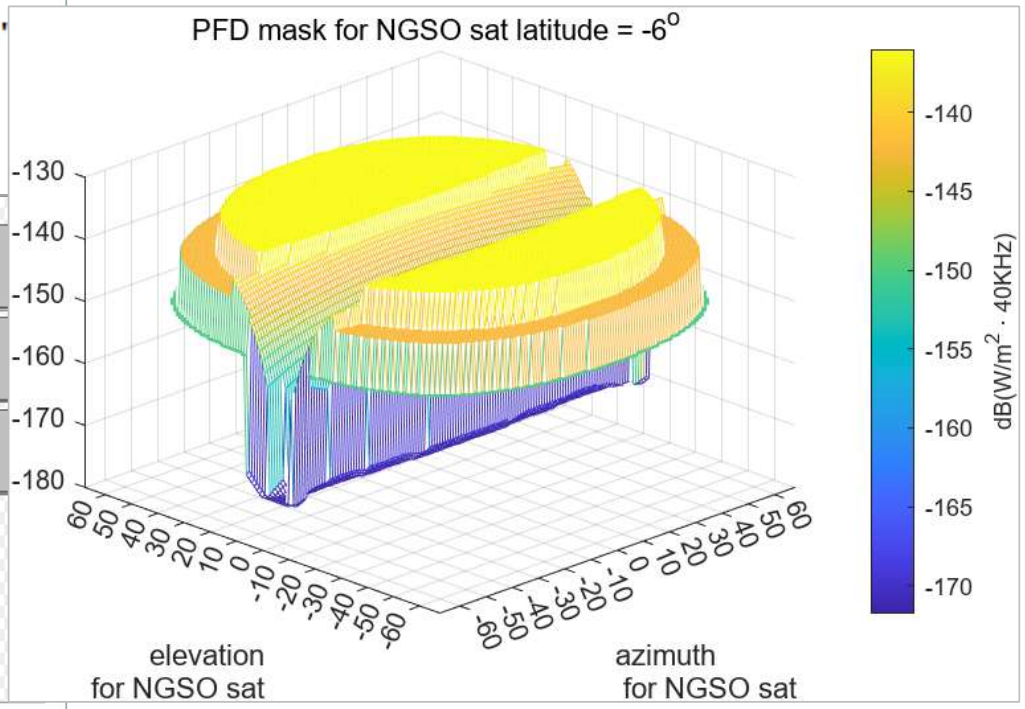
- azimuth_elevation
- α_ΔLon

Developed in Matlab R2024a

PFD Mask Viewer

```
<satellite_system sat_name="USASAT-NGSO-3X" ntc_id="123520029">
  <pfd_mask mask_id="8" low_freq_mhz="10700"
high_freq_mhz="11700" refbw_khz="40" type="azimuth_elevation'
a_name="latitude" b_name="azimuth" c_name="elevation">
    <by_a a="-6">
    <by_b b="48">
      <pfd c="68">-1000.0</pfd>
      <pfd c="67">-1000.0</
      <pfd c="66">-1000.0</
      <pfd c="65">-1000.0</
      <pfd c="64">-1000.0</
      <pfd c="63">-1000.0</
      <pfd c="62">-1000.0</
      <pfd c="61">-1000.0</
      <pfd c="60">-1000.0</
      <pfd c="59">-1000.0</
      <pfd c="58">-1000.0</
      <pfd c="57">-1000.0</
      <pfd c="56">-1000.0</
      <pfd c="55">-1000.0</
      <pfd c="54">-150.0</p
      <pfd c="53">-150.0</p
      <pfd c="52">-150.0</p
      <pfd c="51">-142.0</pfd>
      <pfd c="50">-142.0</pfd>
      <pfd c="49">-142.0</pfd>
      <pfd c="48">-142.0</pfd>
      <pfd c="47">-142.0</pfd>
      <pfd c="46">-142.0</pfd>
      <pfd c="45">-142.0</pfd>
```



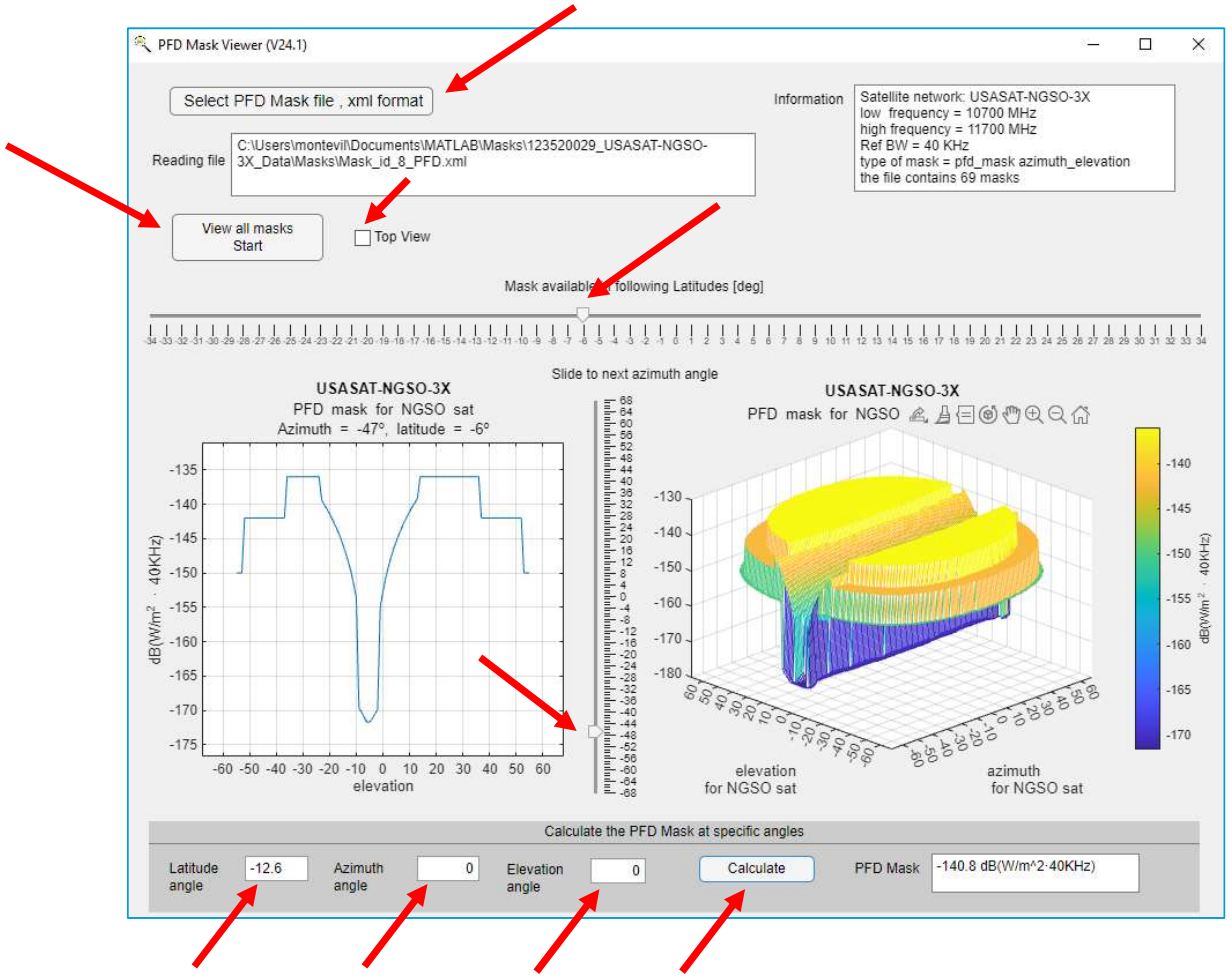


Installation & Usage

Installation

- Download the SW and the user guide from Resources – EPFD Support (https://www.itu.int/epfdsupport/resources/)
- Run PFDMaskViewerInstall v24.1.exe
- If you don't have MATLAB software on your PC, MATLAB Runtime will be downloaded automatically, saved and installed in C:\Program Files\MATLAB\MATLAB Runtime\R2024a.
- MATLAB® Runtime contains the libraries needed to run compiled MATLAB applications on a target system without a licensed copy of MATLAB
- Alternatively, you can download and install the Windows version of the MATLAB Runtime for R2024a from the following link on the MathWorks website: https://www.mathworks.com/products/compiler/mcr/index.htm
- You will need administrator rights to run the MATLAB Runtime installer

Usage


PFD Mask Viewer (V24.1)
Select PFD Mask file , xml format
Information
Satellite network: USASAT-NGSO-3X
low frequency = 10700 MHz
high frequency = 11700 MHz
Ref BW = 40 KHz
type of mask = pfd_mask azimuth_elevation
the file contains 69 masks
Reading file
C:\Users\montevil\Documents\MATLAB\Masks\123520029_USASAT-NGSO-3X_Data\Masks\Mask_id_8_PFD.xml
View all masks Start
Top View
Mask available for following Latitudes [deg]
Slide to next azimuth angle
USASAT-NGSO-3X
PFD mask for NGSO sat
Azimuth = -47°, latitude = -6°
dB(W/m² · 40KHz)
elevation
USASAT-NGSO-3X
PFD mask for NGSO
elevation for NGSO sat
azimuth for NGSO sat
Calculate the PFD Mask at specific angles
Latitude angle
-12.6
Azimuth angle
0
Elevation angle
0
Calculate
PFD Mask
-140.8 dB(W/m^2·40KHz)

Usage

Launch the software by clicking on PFDMaskViewer.exe 

→ Click on the button "Select FPD Mask, xml format" to choose the xml file.

Reading file window indicates the path of the selected file

Information window gives information about the selected mask or if there is any problem reading the file.

→ Click on the button "View all Masks- Start" if you want to see all masks contained in the file. Only the 3D window on the right will be activated.

→Check box Top View at any time, it will set the angle of the view from which the observer sees the 3D plot to overhead view.

→Select with the cursor the latitude in the "latitude slider". This will activate both windows: 3D and 2D.

Usage

→ In the 2D window, depending on the type of PFD mask:

-it will plot the mask with respect to elevation angle at azimuth= 0º, or with respect to α angle at Δlong = 0º

-it will activate the slider "Slide to next azimuth/ α angle“

→ Select with the cursor the azimuth/alpha angle in the “Slide to next azimuth/ α angle” slider by moving the cursor to next angle. It will update the PFD profile in the 2D window.

→ If you put the mouse on the figures, you will see several options: save the figure, rotate, zoom in, zoom out, pan 

→ At the bottom of the window, there is the possibility to calculate the PFD mask at any angle by entering the latitude, azimuth- elevation or α- Δlong angles and pressing calculate.

→ PFD interpolation is done as specified in Recommendation ITU-R S.1503-3:

-latitude: closest one

-azimuth- elevation or α- Δlong angles : bilinear interpolation

Thank you!

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