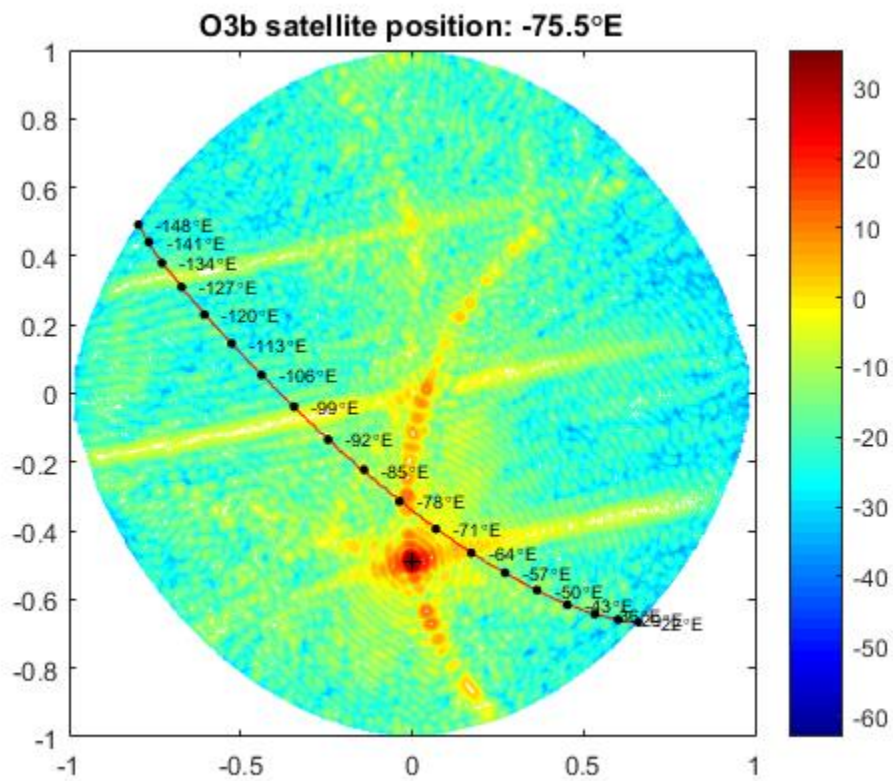


Thales Response to OET Correspondence Reference Number 47796 (dated 5/1/19)

ThinKom Antenna Compliance with EPFD $\uparrow$ limits

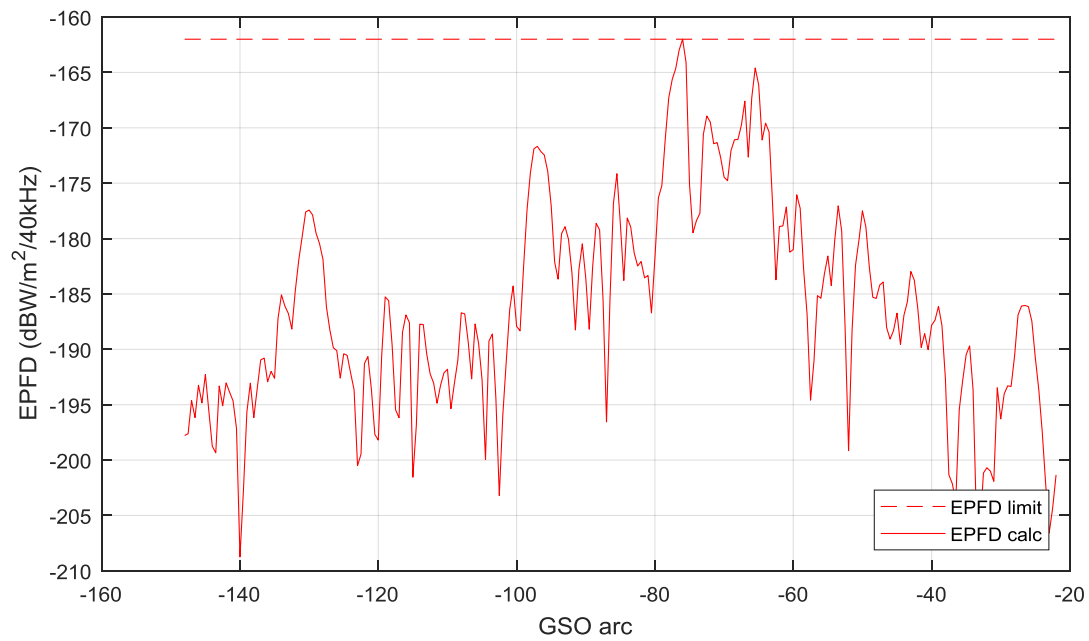
The following graphic illustrates the ThinKom antenna pattern in u/v space with the GSO arc superimposed on to the antenna pattern with the coordinates when the antenna boresight is pointing toward an O3b satellite located at 75.5°W (for example). The colormap shows the antenna gain (units in dBi) as a function of azimuth and elevation angles. The antenna gain data that intersects with the GSO arc is used to determine the gain in the direction of the GSO arc.



The EPFD $\uparrow$ limit is $-162 \text{ dBW/m}^2/40 \text{ kHz}$. The spreading loss determined by the equation

$$\text{spreading loss (dB)} = 10\log_{10}(4\pi d^2)$$

where d is the distance to a point on the GSO arc from the location on the Earth of the transmitting earth station. With the spreading loss, input power spectral density and antenna gain in the direction of the GSO arc, the EPFD $\uparrow$ can be determined. The following graphic illustrates the EPFD $\uparrow$ produced at the GSO arc from the ThinKom antenna.



As seen by the plot above, the ThinKom operations are compliant with the EPFD↑ limits.

Since this is a moving antenna tracking an O3b satellite, the EPFD↑ limits are confirmed in the same way as demonstrated above for all pointing directions along the O3b orbit.