

# Analysis of CURIE Non-Interference with 2395-2400 MHz band

Technical POC:

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## Scope

Through analysis, show that the CURIE space service at 2395 MHz and 2397 MHz do not interfere with amateur radio services in the 2395-2400 MHz band.

## Protection Criteria for the Amateur Radio Service

For non-interference, space services require field strength below the following values, as given in 47 CFR § 15.209 - Radiated emission limits; general requirements:

Above 960 MHz:  $500\mu\text{V/m}$  at a distance  $> 3\text{m}$ .

## Analysis

From Recommendation ITU-R P.525-3, the field strength is calculated as

$$e = \frac{\sqrt{(30p)}}{d}$$

where:

e : r.m.s. field strength (V/m)

p : equivalent isotropically radiated power (EIRP) of the transmitter in the direction of the point in question (W)

d : distance from the transmitter to the point in question (m).

From the CURIE FCC filing, there are two satellites, one with a radio operating at 2395 MHz, and the other operating at 2397 MHz, both with the same ERP. The ERP is 2.71 W, and converting from ERP, the EIRP, p, is 4.44 W. The distance, d, is 500 km.

The electric field strength, e, can then be calculated as:  $e = 23\mu\text{V/m} = 13.6\text{dB}\mu\text{V/m}$ .

## Conclusion

For the CURIE spacecraft parameters, the electric field strength is calculated to be  $23\mu\text{V/m}$  at any ground Amateur Station. This value is below the non-interference requirement of  $500\mu\text{V/m}$  for Amateur Stations. Therefore, the CURIE spacecraft will not interfere with Amateur Stations in the 2395-2400 MHz band.