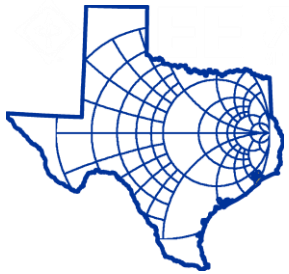

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Regulating and Standardizing Directive Antenna Patterns to Improve Coexistence

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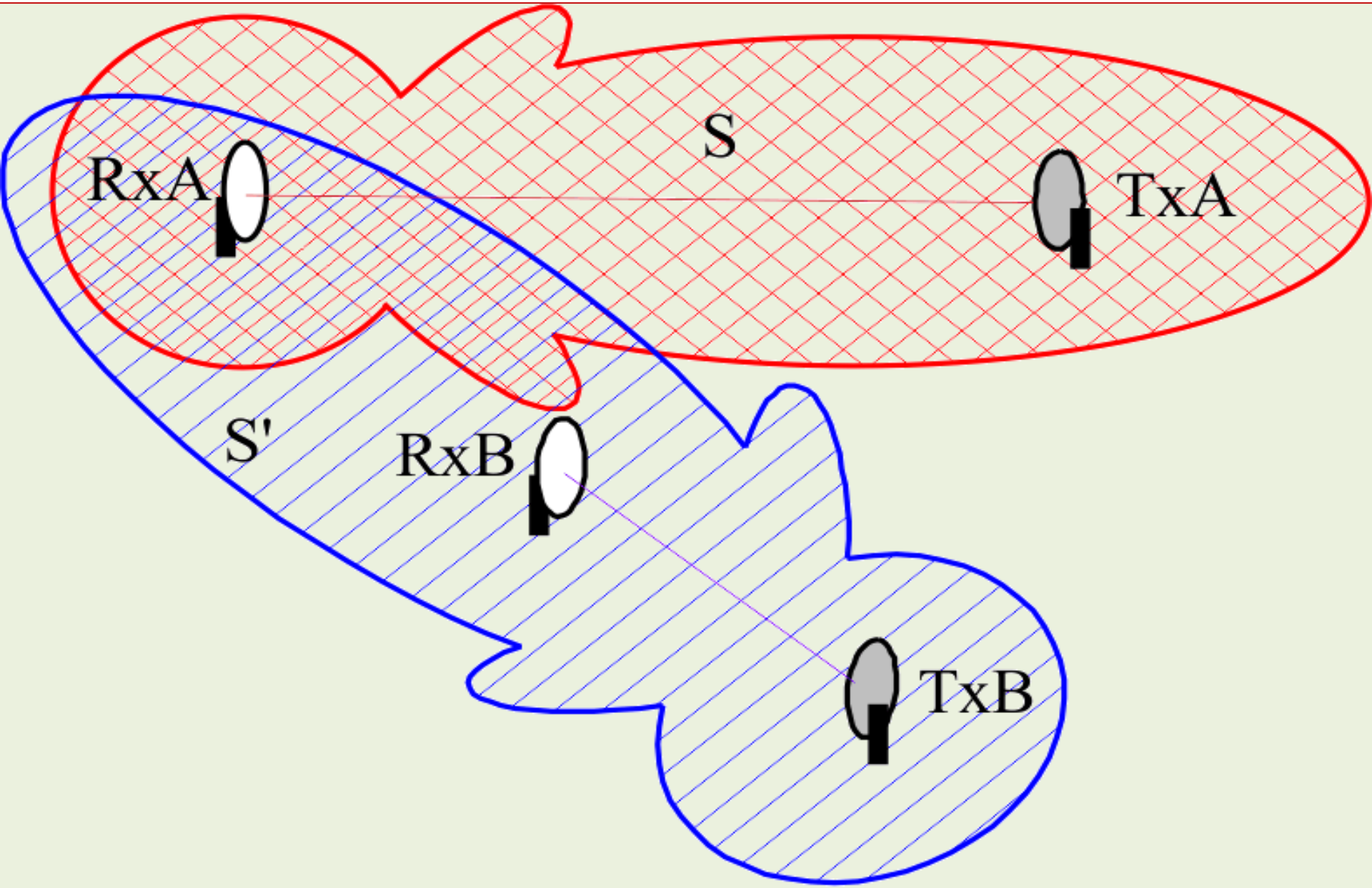
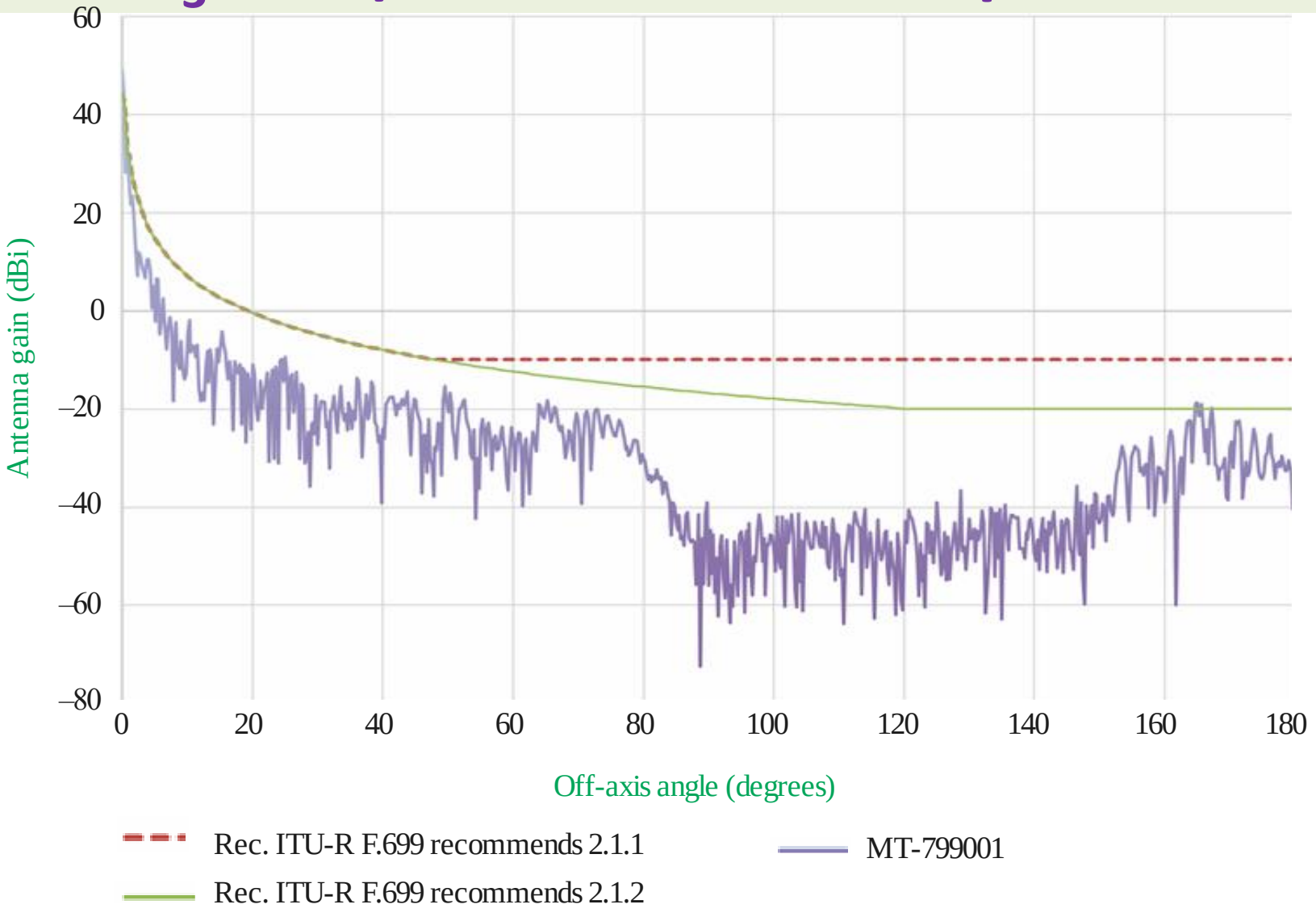
Outline

- Regulation & standardization of ant. patterns is essential to optimize the RF spectrum re-usage
- ITU, ETSI and FCC provide the most useful reference envelopes around the world
- ETSI limits are more restrictive than FCC and the 2018 revision of ITU pattern is significant
- New theoretical evidence for the proposed revision of ITU Recommendation and amendments to restrict FCC and to loosen ETSI standards
- Future work: revision of other ITU antenna patterns such as F.758 and M.1336

Rx_A ant sidelobe gets interference from Tx_B signal

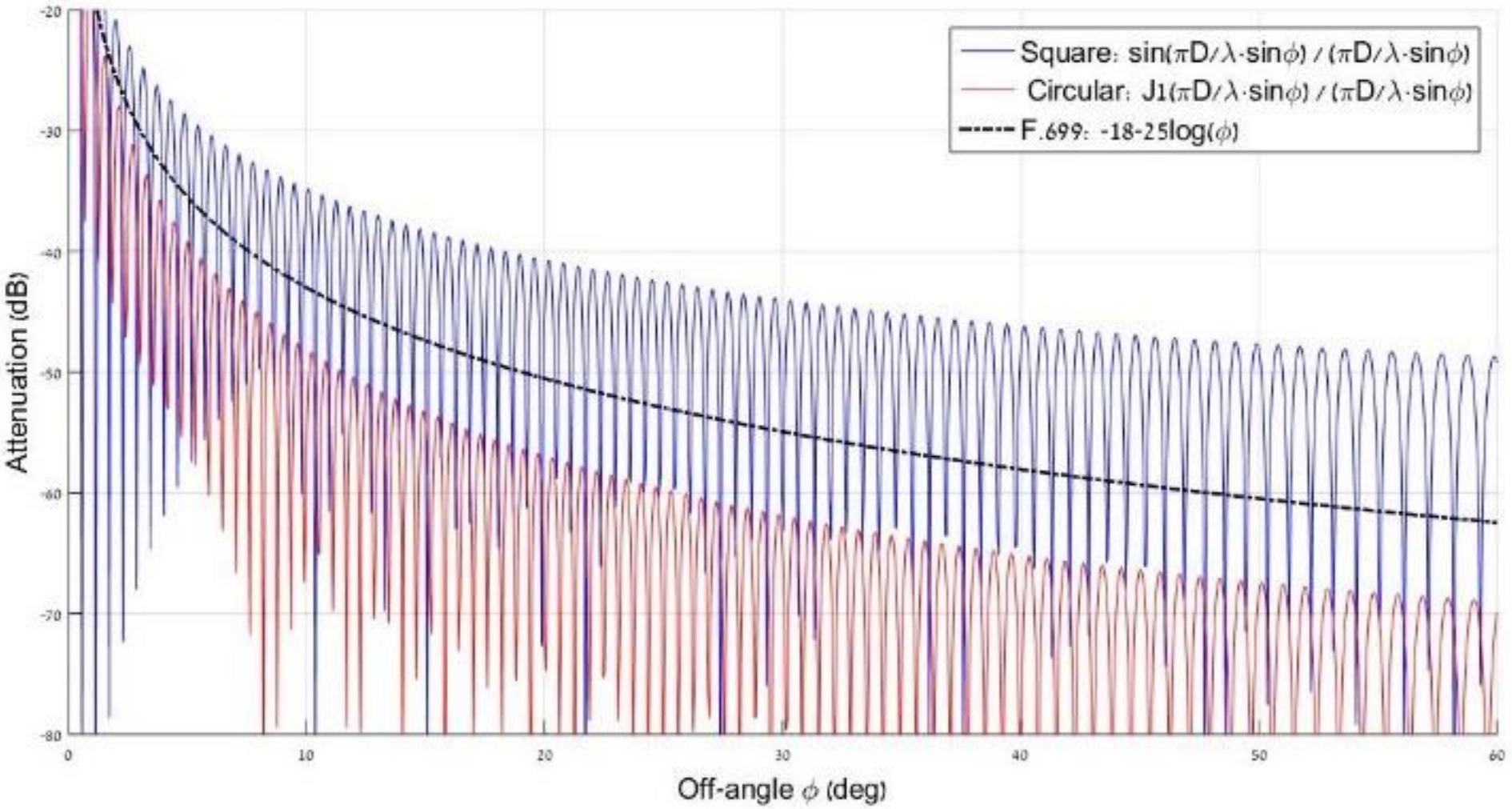


Mti-799001 (2', 49.2 dBi, 71 GHz D/λ=154 θ_3=0.5^0) with or without update

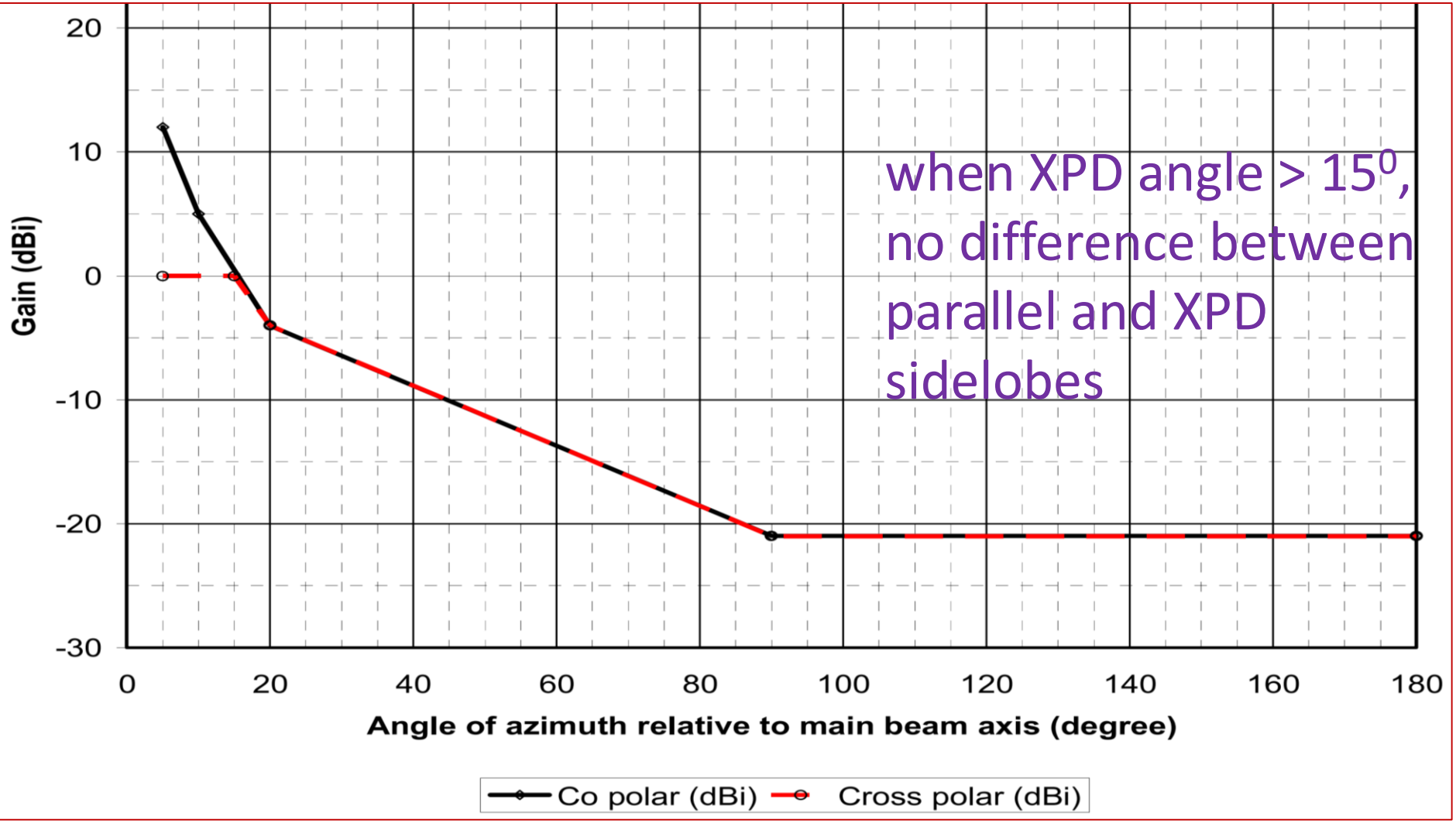


F.0699- 10

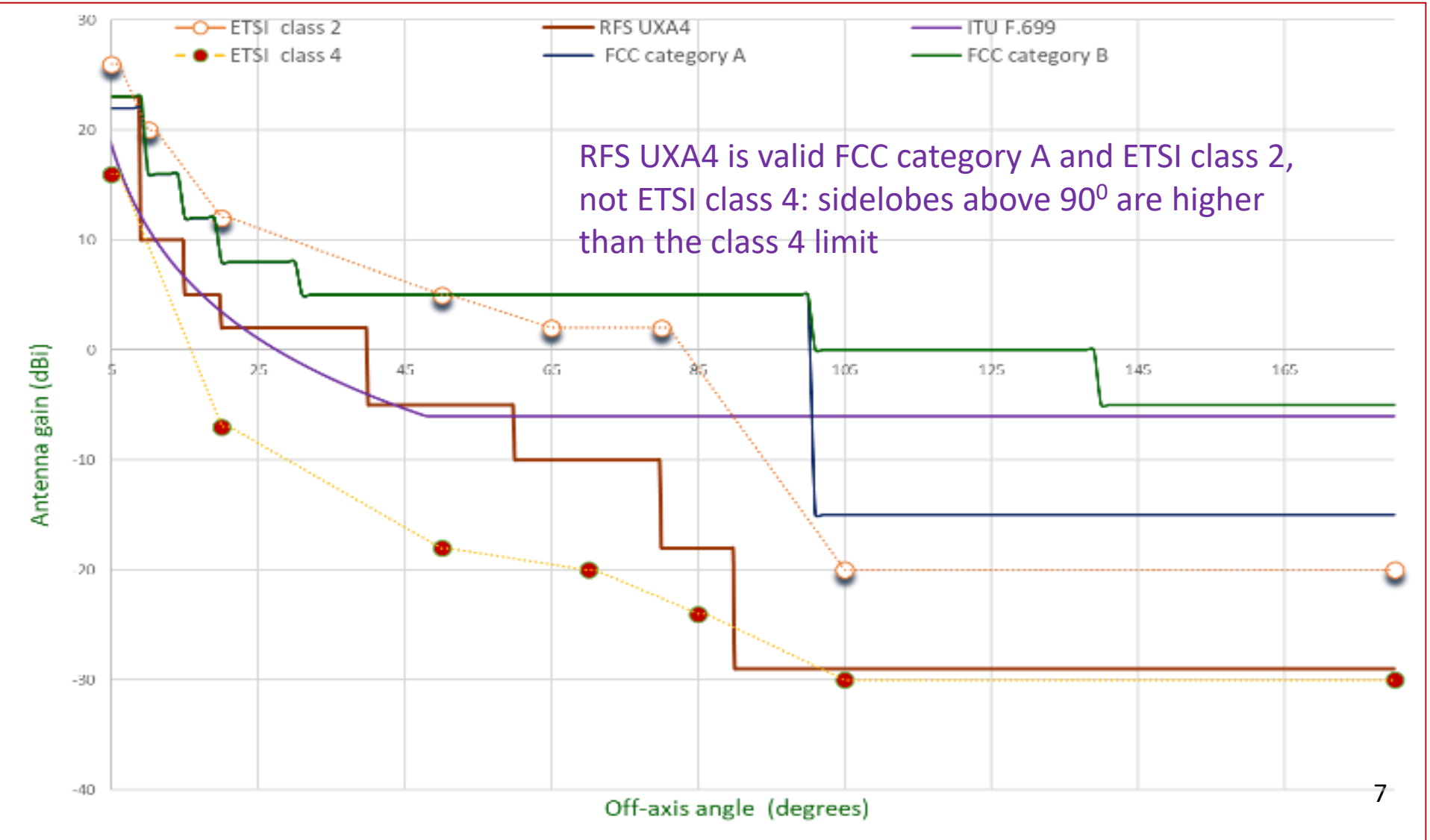
F.699 patterns vs square and circular apertures; explaining 32- **25** log φ for $\varphi < 120$



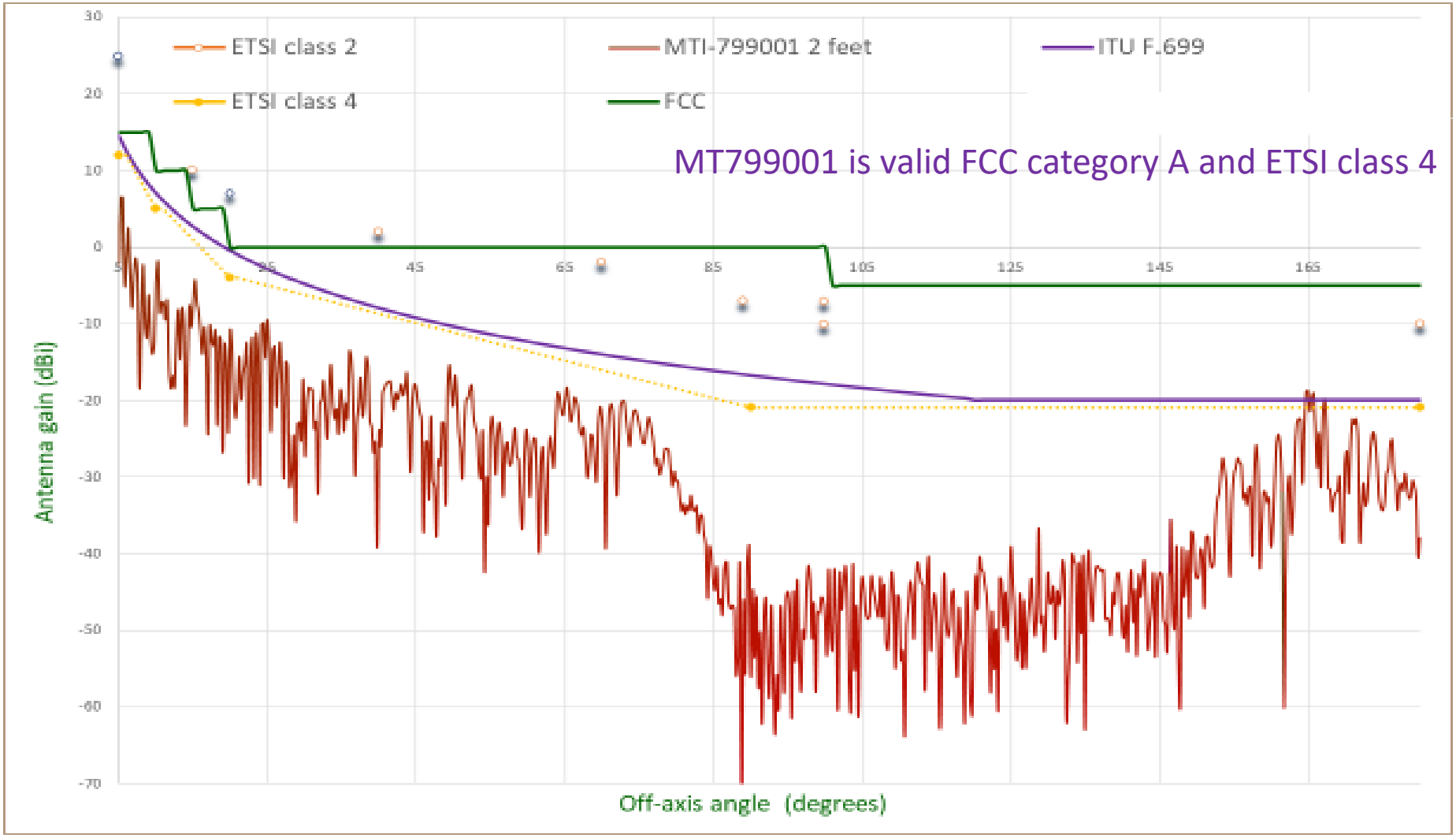
ETSI RPEs for class 4 antennas in 71– 86 GHz



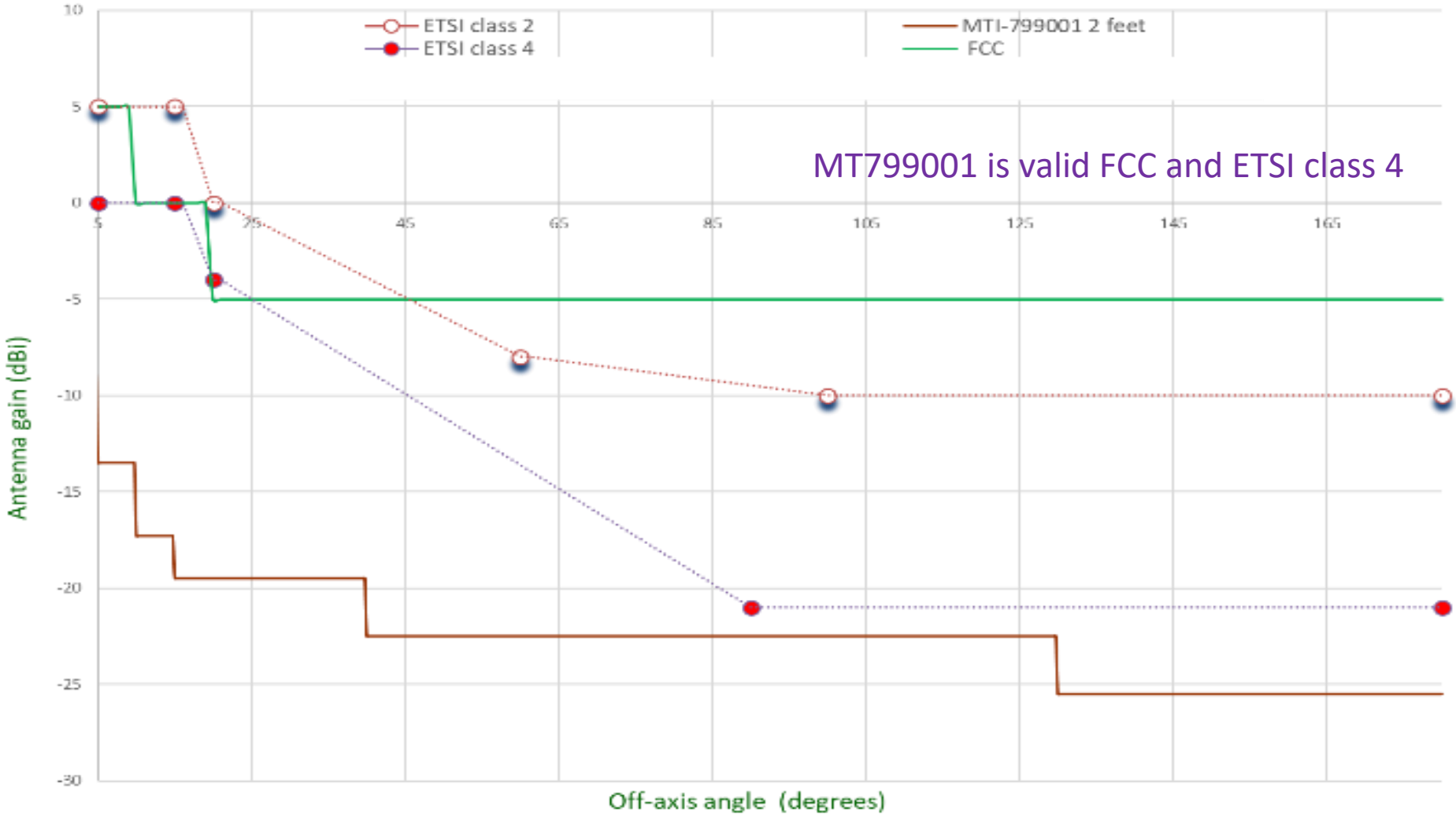
Co-polar; **10.6** GHz; ITU, ETSI, FCC versus RFS-UXA4



CP; **72 GHz**; ITU, ETSI, FCC, MT-799001



XPD; 72 GHz; ETSI, FCC, measurement



Summary

- Similar to the policy of '*laissez faire laissez passer*' for Tx spurious emissions, for antenna patterns Europe is more restrictive than USA and Japan
- Europe having many borders among countries (relative to USA & Japan) & Europe being more condensed than US in population
- In USA real antenna patterns are more restrictive than FCC masks; Americas may aim to category A limits
- The 2018 F.699 envelope, proposed by the author, offers improved spectrum sharing (also for 5G backhaul networks), while maintaining system performance and implementation feasibility

The IEEE text is found at https://ieeexplore.ieee.org/abstract/document/8400643/ & http://mazar.atwebpages.com/Downloads/AntennasPatterns_2018_IEEE_Texas_Mazar_8400643_2018-04-06.pdf