



August 30, 2021

**BY ELECTRONIC FILING**

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
45 L Street NE  
Washington, DC 20554

Re: Viasat, Inc. Notice of *Ex Parte* Presentation, IBFS File Nos. SES-LIC-20170401-00357, SES-LIC-20190411-00503, SES-MOD-20191216-01737, SES-MOD-20200923-01031, SES-LIC-20201204-01303, SES-LIC-20200811-00852

Dear Ms. Dortch:

On August 26, 2021, the undersigned and Jarrett Taubman from Viasat, Inc. held a teleconference meeting with the individuals copied below from the Commission's International Bureau. At the meeting, we discussed the attached presentation and Viasat's positions of public record in the above-referenced proceedings. Viasat is electronically filing a redacted version of this submission for public inspection and is separately submitting a confidential version in accordance with the Commission's procedures.

Respectfully submitted,

/s/

Amy R. Mehlman  
Vice President  
US Government Affairs and Policy

cc: Jennifer Balatan  
Jameyanne Fuller  
Joseph Hill  
Karl Kensinger  
Kal Krautkramer  
Kathryn Medley  
Kerry Murray  
Alan Thomas  
Merissa Velez

REDACTED FOR PUBLIC INSPECTION

# Compatibility with SpaceX in the Shared Bands (18.8-19.3 GHz and 28.6-29.1 GHz)

August 26, 2021

Viasat™ 

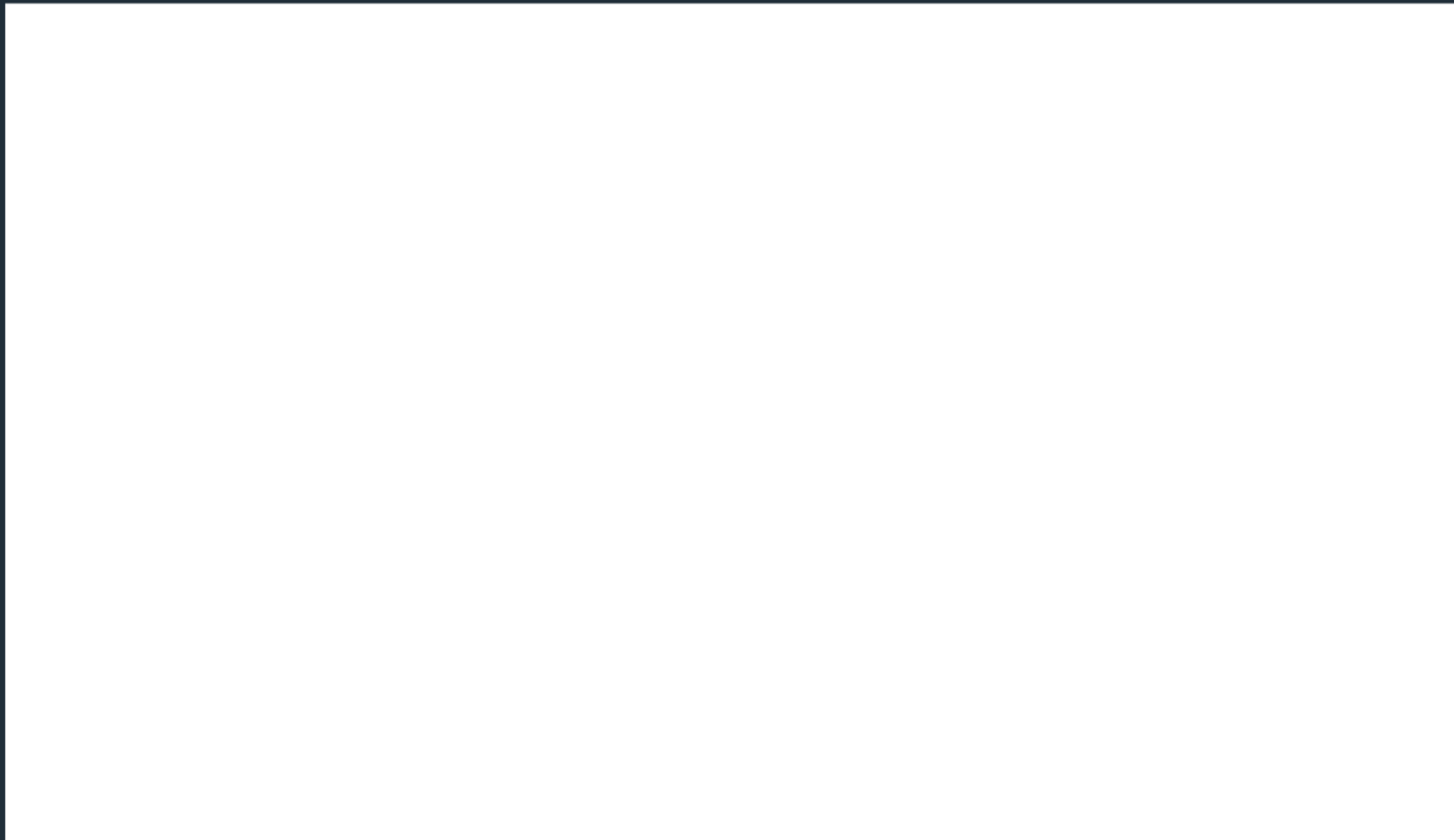
# Overview

- > Viasat's operations in the Shared Bands are consistent with the FCC's rules and relevant license conditions, as well as:
  - The sharing environment that SpaceX fostered for years in seeking to deploy its system
  - Substantive coordination terms proposed and agreed to by SpaceX
- > More specifically, SpaceX sought to facilitate compatibility with GSO operators in the Ka band based on GSO arc avoidance, as this would provide numerous benefits to SpaceX
- > Viasat has demonstrated, repeatedly, that GSO arc avoidance ensures that SpaceX is protected from GSO operations in the Shared Bands
- > The FCC should confirm the validity of Viasat's technical demonstrations and thus provide much-needed certainty while protecting existing operations in the Shared Bands

## SpaceX Defined a Sharing Environment Based on GSO Arc Avoidance

- > **Nov. 2016** – SpaceX’s initial NGSO system application explains that it “uses a straightforward GSO arc avoidance strategy . . . to protect GSO satellite networks . . . in the Ka-band” and that “the necessary GSO arc avoidance angle is 22 degrees”
- > **Dec. 2017/Jan. 2018** – SpaceX’s response to Viasat technical demonstrations confirms that SpaceX had “announced its intention to observe a 22-degree separation from the GSO arc,” and does not challenge Viasat’s further technical showing that it can coexist with SpaceX
- > **Feb.-Apr. 2018** – In coordination discussions with Viasat, SpaceX proposes [REDACTED]
- > **June 2019** – SpaceX presents substantive coordination terms proposing [REDACTED]
- > **July 2020** – SpaceX’s Opposition in the Mod3 proceeding explains that its use of an 18° separation angle from the GSO arc ensures SpaceX avoids causing significant additional interference to NGSO operators in equatorial orbit (e.g., O3b)

# June 2019 SpaceX Coordination Terms



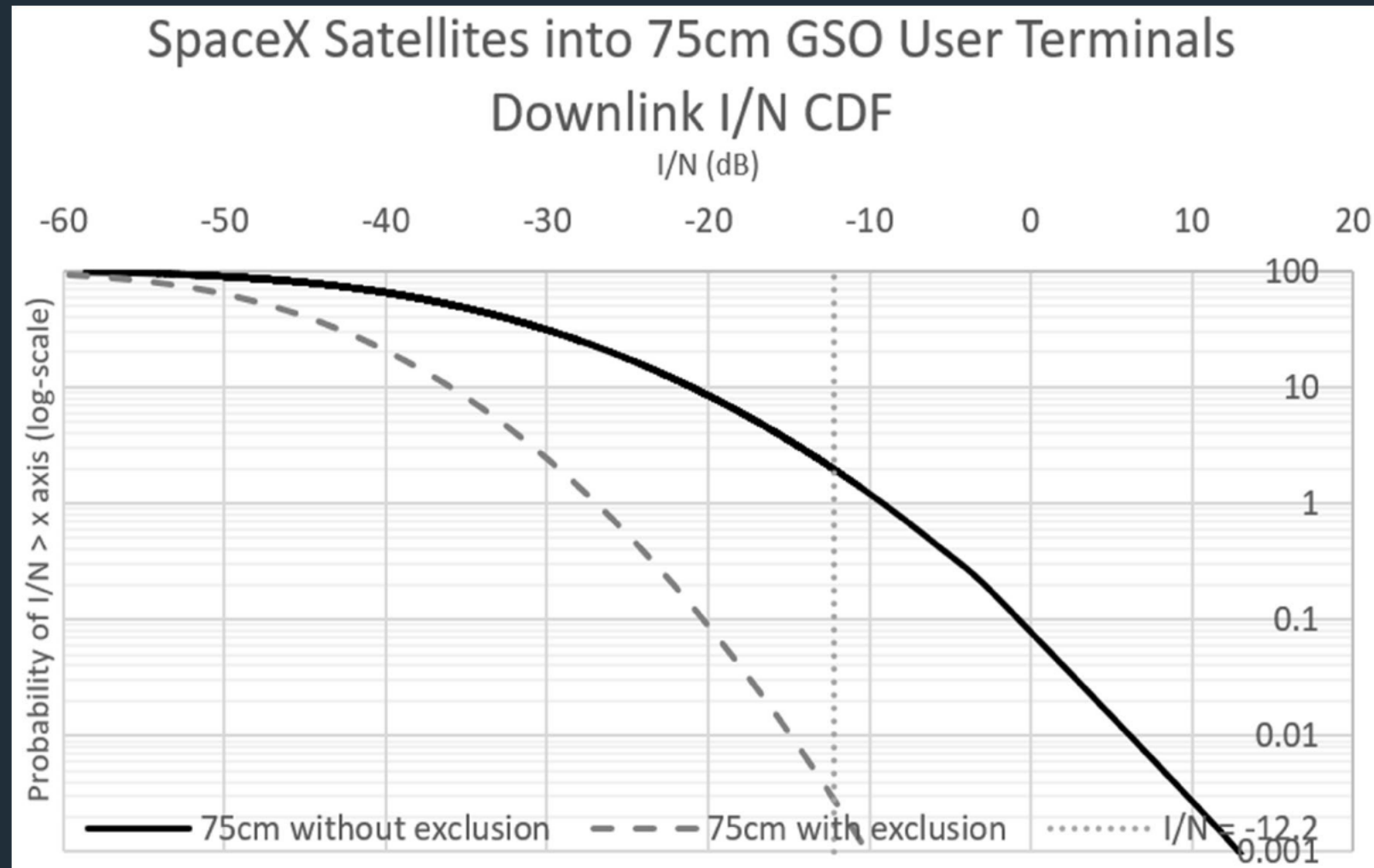
# SpaceX Proposed and Agreed to Substantive Coordination Terms Based on GSO Arc Avoidance

- Notwithstanding the parties' agreement w/r/t mutually acceptable coordination terms, a formal coordination agreement was not executed in June 2019
  - When asked whether SpaceX had a "technical or operational" issue that Viasat could address, SpaceX replied "I think the issue is that we would like not to conflate the on-going proceeding on ViaSat's earth stations at the FCC with this coordination agreement."
  - SpaceX resisted adding a sentence confirming that ESIMs were covered, explaining that it was worried about the terms of coordination "being used against us in the ongoing FCC ESIMs proceeding"
  - SpaceX had a clear incentive not to allow Viasat to demonstrate completion of coordination for purposes of its earth station license conditions
  - However, SpaceX explicitly told Viasat that it was "free to operate" ESIMs under the terms of coordination if it believed they were covered, with "no need to call them out explicitly"
  - The WRC subsequently confirmed that for coordination purposes it is appropriate to treat ESIMs as another type of FSS earth station
- SpaceX confirmed that, apart from the ESIM confirmation issue, it was "good to sign" the agreement reflecting *the very terms it proposed*

# GSO Arc Avoidance Is an Effective Sharing Technique

- > SpaceX's own actions reflect the significant operational benefits that SpaceX derives from GSO arc avoidance—including in the Shared Bands
- > Coordination on this basis makes SpaceX better off by (among other things):
  - Allowing SpaceX to operate globally in the Shared Bands, including where it does not have ITU priority
  - Allowing SpaceX to effectively utilize spectrum across the Ka band—including where EPFD limits apply
  - Allowing SpaceX to coexist with all GSO operators
  - Allowing SpaceX to avoid causing interference to and suffering interference from GSO operations in Mexico, Canada, and waters and airspace adjacent to the U.S.
- > Graphs on next few slides illustrate that GSO arc avoidance facilitates NGSO and GSO system compatibility in the same spectrum

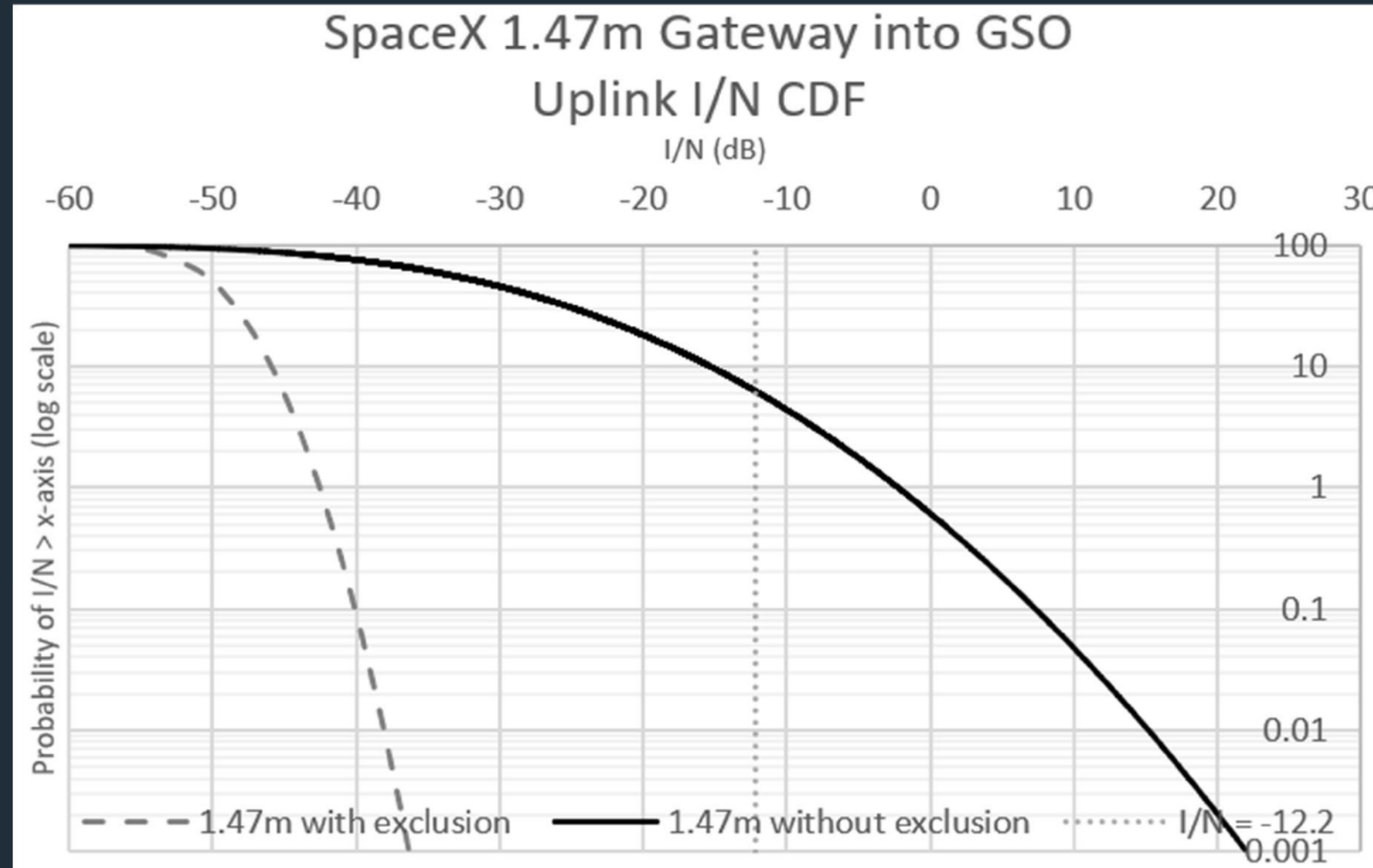
# Impact of GSO Arc Avoidance



Interference into victim 75cm GSO user terminals from SpaceX NGSO satellites pointing toward SpaceX Gateways represented as normalized percentage likelihood (vertical axis) of I/N (dB) being above the x-axis value at any given moment in the simulation. Values above -12.2 are considered in exceedance. Dotted line is with 18° GSO arc exclusion, solid line is without.

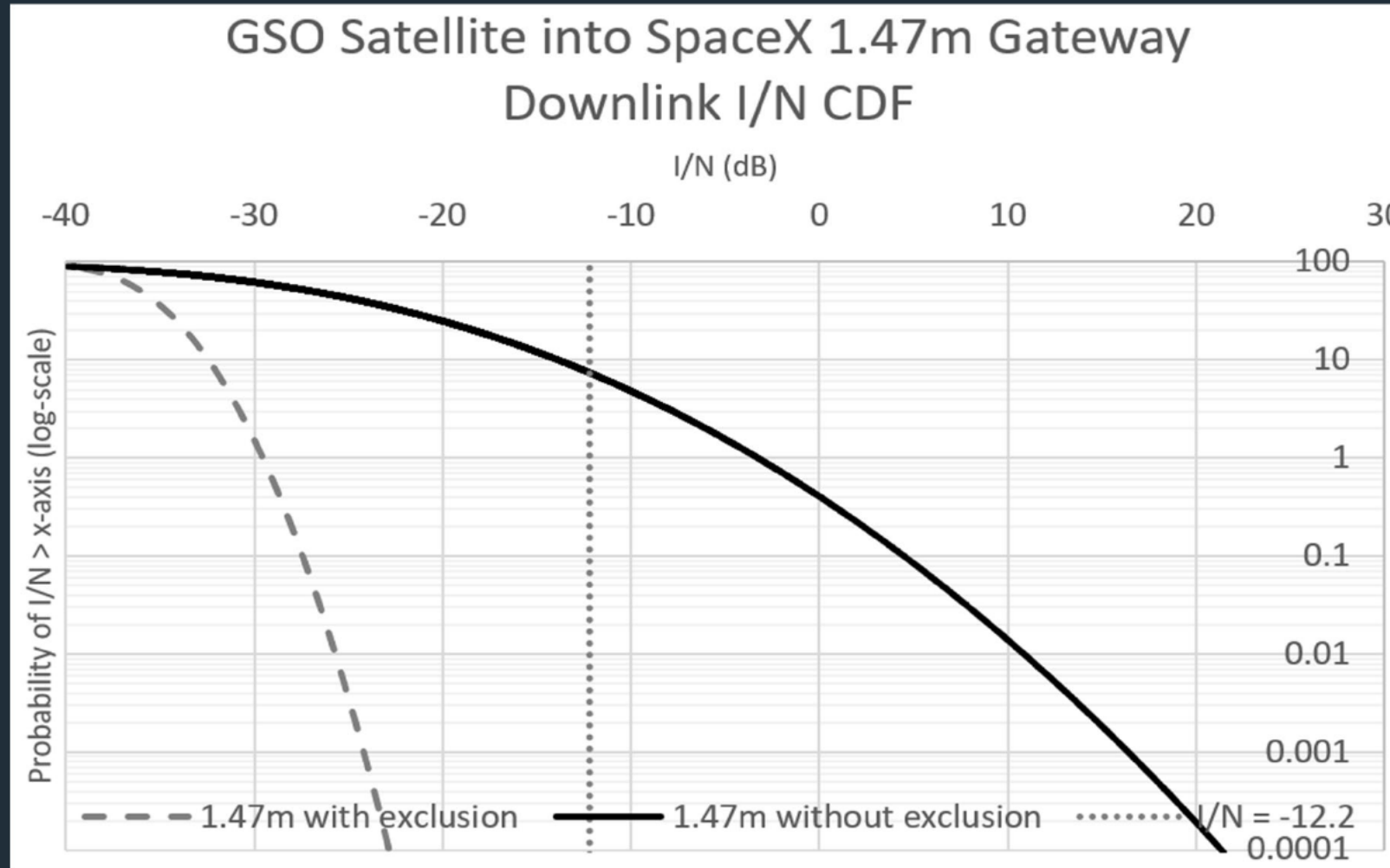


# Impact of GSO Arc Avoidance



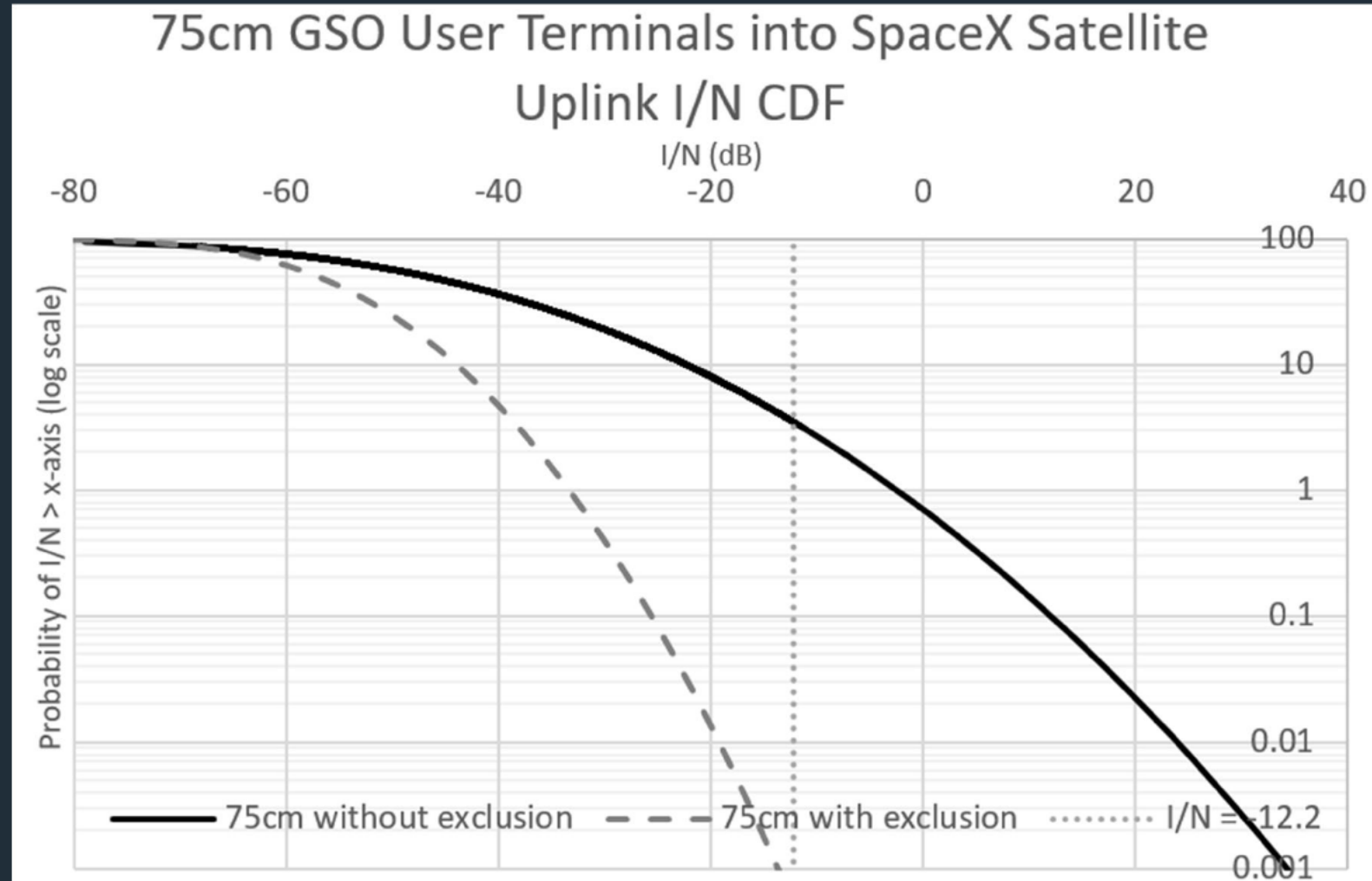
Interference into victim GSO satellites from SpaceX ground terminals pointing toward SpaceX NGSOs represented as normalized percentage likelihood (vertical axis) of I/N (dB) being above the x-axis value at any given moment in the simulation. Values above -12.2 are considered in exceedance. Dotted line is with 18° GSO arc exclusion, solid line is without. Viasat GSO antenna properties were used in this simulation as representative of GSO satellite properties.

# Impact of GSO Arc Avoidance



Interference into victim 1.47m SpaceX user terminals from GSO satellites pointing toward GSO ground terminals represented as normalized percentage likelihood (vertical axis) of I/N (dB) being above the x-axis value at any given moment in the simulation. Values above -12.2 are in exceedance. Dotted line is with 18° GSO arc exclusion, solid line is without. Viasat GSO antenna properties were used in this simulation as representative of GSO satellite properties.

# Impact of GSO Arc Avoidance



Interference into victim SpaceX NGSO satellites from 75cm user terminals pointing toward GSOs represented as normalized percentage likelihood (vertical axis) of I/N (dB) being above the value at any given moment in the simulation. Values above -12.2 are considered in exceedance. Dotted line is with 18° GSO arc exclusion, solid line is without.

# Viasat's Operations Are Consistent with FCC Rules and Conditions

- Viasat has operated in the Shared Bands for years without causing harmful interference to any other operator
- SpaceX has not identified any actual interference, and claims of simulated interference are based on flawed assumptions that are inconsistent with the real world
  - Ku-band EPFD limits prevent SpaceX user link operations within 18° of the GSO arc—so its Ka-band gateways cannot pass user traffic within that angle of operations
  - SpaceX must use angular separation at Ka band to protect various GSO systems operating outside the United States, and also avoid debilitating interference from them (Including when those GSO systems operate in Canada, Mexico, and international waters or airspace immediately outside the United States)
- SpaceX simulations are also inconsistent with its repeated assurances underlying its FCC license about maintaining GSO arc avoidance

# The FCC Should Confirm the Validity of Viasat's Technical Demonstrations

- > Viasat has made numerous technical demonstrations showing how SpaceX would be protected in the Shared Bands, within a sharing environment that SpaceX itself fostered
  - December 2017 - Viasat submitted detailed technical analysis demonstrating that Viasat operations in the Shared Bands would not pose a risk of harmful interference into existing and proposed NGSO systems, including SpaceX's
  - January 2018 - Viasat submitted additional technical analysis responding to questions that SpaceX had raised with respect to Viasat's earlier analysis; SpaceX raised no further concerns
  - May 2020 - Viasat submitted a summary of technical coordination terms that had been mutually identified by Viasat and SpaceX as sufficient to protect SpaceX operations in the Shared Bands
  - April 2021 - Viasat submitted technical analysis again modelling the compatibility of Viasat operations and SpaceX's modified NGSO system
- > There is more than adequate basis for the FCC to confirm that Viasat has reasonably satisfied any obligations toward SpaceX w/r/t the Shared Bands, and to reject SpaceX's improper "complaints"