I apologize for the lack of detail in my previous responses to some of the questions. I will now address your comments more thoroughly, with particular focus on the points you raised in comments 9 and 12:

(9)

Thanks for your remind. While the raw electromagnetic propagation through a neutral troposphere at GNSS L-band exhibits negligible frequency dispersion, different GNSS signals may still show different loss-of-lock behaviors due to receiver tracking loop sensitivity and signal structure differences.

Modern GNSS carrier and code tracking loops (PLL/DLL) rely on signal power, modulation format, and the presence of a pilot channel to maintain lock. In some signal designs (e.g., earlier BDS B1/B3), the pilot carrier may be absent or defined differently, which forces the carrier tracking loop to rely solely on the data channel with frequent navigation bit transitions. In contrast, signals with an independent pilot (such as modern L1C/B1C) generally enable higher tracking stability and more robust phase/frequency estimation under the same conditions.

These implementation and signal design differences can result in higher loss-of-lock rates on certain frequencies, even though the tropospheric refractive delay itself is essentially nondispersive across the L-band and thus does not intrinsically cause larger tropospheric bending or attenuation differences between B1 and B3. Any measurable differences in refractivity estimates may instead be associated with residual ionospheric effects, receiver tracking performance under multipath/noise, or structural differences in the signal and receiver algorithms.

(12)

Here, “optical path” is used to indicate the actual ray path length through hydrometeor-rich/cloudy regions that can introduce additional attenuation or phase/angle perturbations.

According to standard cloud classification, mid-level cloud types such as altocumulus and altostratus typically occur in the mid-troposphere, ranging roughly from a few kilo meters up to around 6–8 km depending on weather regime and latitude, whereas low clouds (e.g., cumulus, stratocumulus) are typically below ~2–3 km and high clouds (e.g., cirrus) occur above ~6 km. This classification reflects the relative vertical occurrence of cloud types, not a single altitude of “maximum cloud concentration”.

I have revised the sentence to:

“In the mid-troposphere，a few kilometers in altitude, certain cloud layers such as altocumulus and altostratus are commonly present. Radio occultation rays that intersect these layers may traverse an

extended optical path through moist/cloudy regions, potentially influencing attenuation or refractivity retrievals depending on local water/ice content and particle phase distribution."