Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
ZenFi Networks, Inc. and	)	WT Docket No. 15-245
	)	
Geneva Communications LLC	)	
	)	
Request for Waiver for Service in the 102-109.5 GHz Band	)	

COMMENTS OF THE NATIONAL ACADEMY OF SCIENCES' COMMITTEE ON RADIO FREQUENCIES

The National Academy of Sciences, through the Committee on Radio Frequencies (hereinafter, CORF[1]), hereby submits its comments in response to the Commission's October 13, 2015, *Public Notice* regarding the above-captioned requests for waivers. CORF has long supported thoughtful sharing of spectrum, where practical. Accordingly, CORF does not oppose waivers for fixed terrestrial use of the 102-109.5 GHz band in the specific geographic areas named in the waiver requests, as long as the waivers are conditioned on protecting Radio Astronomy Service (RAS) observations from interference, as proposed in the waiver requests.

I. Introduction.

CORF has a substantial interest in this proceeding, as it represents the interests of the passive scientific users of the radio spectrum, including users of the RAS bands. RAS observers perform extremely important, yet vulnerable, research.

As discussed in CORF's comments filed in RM-11713, the RAS has a co-primary allocation in the 102-109.5 GHz (100 GHz) band, as well as protection mandated by Footnote

[1] See the Appendix for the membership of the Committee on Radio Frequencies.

US342.[2] Observations in the 100 GHz band are essential to astronomical research. Because there is only modest absorption from atmospheric oxygen and water in this band, it is one of the best high-frequency resources for both continuum and line observations of celestial objects.[3] Observations in the 100 GHz band are critical for scientific research and are, have been, and will continue to be regularly performed at U.S. observatories.

II. CORF Does Not Oppose These Waiver Requests, Subject to Conditions to Protect RAS Observations.

RAS is a co-primary service in the 100 GHz band, and RAS observations in that band will need to be protected. Where RAS observations in the band occur, the observations can occur for a large fraction of the potential observing time.[4] Many different spectral lines of interest to the RAS fall in the band, and commercial transmissions received by RAS observatories during times of observation would likely compromise those observations or could even damage the RAS receivers. It is appropriate and encouraging that the waiver request filed by ZenFi Networks, Inc. (ZenFi) acknowledges the general need to protect RAS observations in the band, and that the waiver request filed by McKay Brothers, LLC on behalf of Geneva Communications LLC (Geneva) seeks authorization "in a manner similar to that requested by ZenFi." CORF has long supported thoughtful sharing of spectrum, where practical. Accordingly, CORF does not oppose these waivers for fixed terrestrial use of the 100 GHz band,

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[2] US342 provides that "all practicable steps shall be taken to protect the radio astronomy service from harmful interference" in this band.

[3] Frequencies such as 102.5 GHz and 107.014 GHz are among the frequency lines of greatest importance to the RAS. *See* ITU Handbook On Radio Astronomy (ITU Radiocommunications Bureau, 2013) at Table 3.2. In addition, Table 3.1 of the ITU Handbook lists 76-116 GHz as one of the frequency bands preferred for continuum observations.

[4] CORF also notes that the adjacent 100-102 GHz band is allocated to the Earth Exploration Satellite Service (EESS), the RAS, and the Space Research Service (SRS). Similarly, the adjacent 109.5-111.8 GHz band is allocated to EESS, RAS, and SRS. While CORF does not believe that out-of-band-emissions (OOBE) to these passive bands should be a problem in the specified geographic areas listed in the waiver requests, in any future proceedings involving the 102-109.5 GHz band, the Commission should consider OOBE limits to protect the vulnerable adjacent passive bands.

with the condition that they are subject to properly designed and executed frequency coordination that provides the protection required for RAS observatories, where necessary.[5]

In analyzing the potential for interference, geography is important. The waiver request filed by ZenFi proposes use of the 100 GHz band links in the New York City, Chicago, Washington, D.C., and San Francisco "metropolitan markets." The waiver request filed by Geneva proposes operation of such links "in and around Chicago, New York City, and northern New Jersey." While the geographic breadth of the terms "metropolitan markets" and "in and around" should be clarified, there currently are no major RAS observatories within a reasonably interpreted distance of those named markets. Of course, changes in the RAS facilities certainly occur over time. Thus, ZenFi's proposal of a "waiver condition that would require future links to be coordinated with International Radio Advisory Committee at such time as additional RAS observatories are built in or near the four identified metropolitan geographic markets" is necessary and may be sufficient in the context of this limited waiver.[6] Moreover, any waivers granted by the Commission should be conditioned more generally on not causing interference to RAS observations in this band. In light of the current lack of RAS observatories in the specified geographic areas, compliance with such conditions should not be at all burdensome on ZenFi or Geneva.

III. Conclusion.

Observations at 102-109.5 GHz band are critical for astronomical research and are, have been, and will continue to be regularly performed at U.S. observatories. Nevertheless, CORF

[5] The 100 GHz band is not allocated for aeronautical uses, and any such uses would raise significant additional interference issues for the RAS. CORF also notes that unlicensed use of this band is currently prohibited, and unthoughtful unlicensed use could cause very problematic interference to scientific use of the band.

[6] In the context of the rulemaking sought in RM-11713 for nationwide use of the 100 GHz band for fixed terrestrial links, CORF has suggested use of the existing 70/80/90 GHz notification and coordination database, assuming that such system properly protects major RAS facilities observing in the 100 GHz band.

does not oppose the proposed waivers in the specified geographic areas for fixed terrestrial use of the 100 GHz band, as long as the waivers are conditioned on protecting RAS observations.

Respectfully submitted,

NATIONAL ACADEMY OF SCIENCES'
COMMITTEE ON RADIO FREQUENCIES

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Appendix

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