

On spectrum extension beyond 71 GHz

RAN Rel-18 Workshop

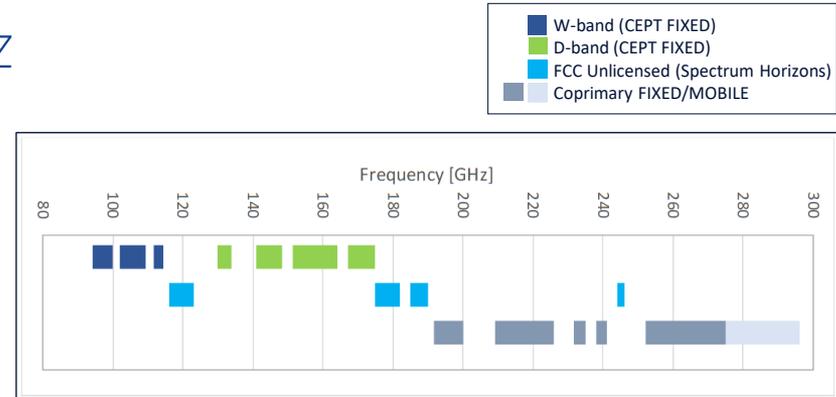
28th June – 2nd July 2021

RWS-210119

Nokia, Nokia Shanghai Bell

Spectrum extension beyond 71 GHz

- For the future, spectrum extension beyond 71 GHz is an interesting direction to pursue for substantial additional capacity
- In the range 95-275 GHz:
 - W and D bands allocated for mobile service with primary status, together with fixed services
 - CEPT ECC approved recommendations for fixed services in W and D bands.
 - FCC has allocated 21 GHz of new unlicensed spectrum in four distinct bands with rules similar to US 57-71 GHz band (new license type “Spectrum Horizons Experimental License” for developing new services)
 - Even larger amount of spectrum identified for mobile and fixed services in 275-450 GHz range at WRC-19.



- The key question is the appropriate timing for such work in 3GPP:
 - Work related to 52.6 - 71 GHz is ongoing
 - Lower bands have deployment advantages and are currently attracting more commercial interest
 - Commercial opportunities for 60 GHz bands should be explored first

Release 18 is too early for studies beyond 71 GHz,
but such frequencies have potential for massive additional capacity in a later release

Background

Spectrum and technical considerations beyond 71 GHz

71 – 114.25 GHz

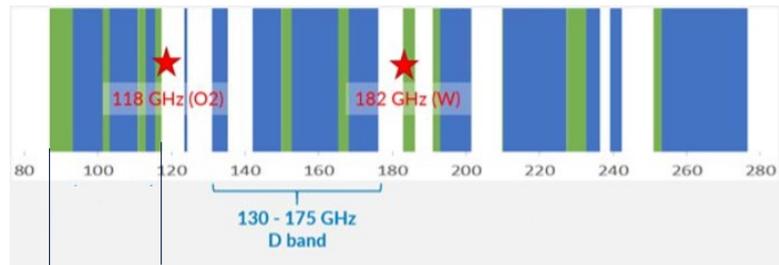
- W Band ECC Recommendation ECC/REC/(18)02 on frequencies 92-114.25 GHz
- Total BW available is 15.9 GHz (in three portions)
 - ITU RR5.340 bands for passive use limit the contiguous bandwidth available
- Existing 3GPP TR38.901 channel model can be applied

Beyond 114.25 GHz

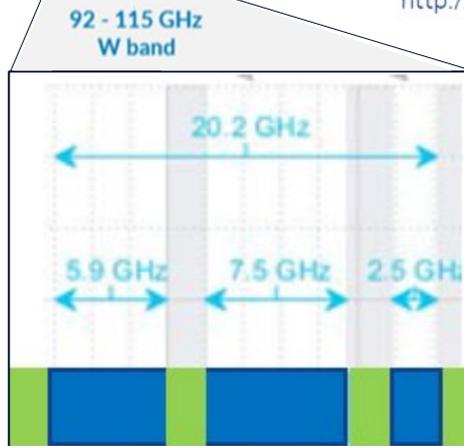
- Longer-term, for future study
- THz channel model targeting to 100-300 GHz would need to be defined first

Waveform considerations

- Assume that both coverage and PA technology are unchanged when doubling the carrier frequency
 - number of Tx antennas must be increased by factor 4
 - considerable increase in hardware cost and power consumption
 - **Frequencies >71 GHz would benefit from SC waveform with spectral shaping for both DL and UL**



<http://www.brave-beyond5g.com/>



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