

ESOA view on Spectrum Sharing

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Satellite Industry has a long history of sharing spectrum successfully

- ◆ Many satellite operators “share” the same satellite spectrum every 2 - 3 degrees along the geostationary (GEO) arc
- ◆ Satellite spectrum is being shared between GEO satellites, and satellite constellations in medium earth orbit (MEO) or low earth orbit (LEO)
- ◆ Many satellite bands are also shared on individually coordinated basis with point-to-point terrestrial fixed services
- ◆ Satellite bands will be shared with RLAN systems in the 6 GHz band in Europe & US



Sharing between ubiquitously deployed satellite services & terrestrial mobile services has not shown to be feasible – there is no win-win for this situation

The Satellite Perspective

- ◆ Satellite projects need to plan long ahead in the future - regulatory certainty at international level is of highest importance
- ◆ The signals from satellites in space are already relatively ‘weak’ by the time they reach Earth
- ◆ Compare:
 - ❖ Typical C-band EIRP from a GEO satellite: 40 dBW / 54 MHz
 - ❖ 5G base station transmit EIRP: 65 dBm / 5 MHz \approx 45 dBW / 54 MHz

A satellite receiver needs to decode a signal from a satellite which is 36000 km away transmitted at lower power than the 5G base station which is only a few blocks away from where you live or work

C-band

- ◆ Various spectrum sharing initiatives have been announced / are being implemented (e.g. FCC “CBRS”, Ofcom “Innovative sharing”) in C-band downlink range
- ◆ Satellite operators & customers already face reduced availability of spectrum in many countries due to introduction of 5G
 - ❖ In many cases satellite services are no longer afforded protection
 - ❖ Earth station operators need to incur costs (financial & performance) to install filters
 - ❖ Adjacent band coexistence needs regulatory safeguards

- ⇒ Users of C-band satellite services need guaranteed access to the band
- ⇒ Their use of 3800-4200 MHz will become more densified
- ⇒ They therefore require flexibility in that band

mmWave bands

- ◆ WRC-19 identified several mmWave frequency bands for IMT – including some with satellite allocations: e.g. 26 GHz / 40 GHz bands
- ◆ With adequate protection & coordination mechanisms in place, sharing is feasible in bands where individually licensed earth stations are to be deployed
- ◆ ITU work has started to develop appropriate Recommendations for such cases
- ◆ Bands where earth stations will be ubiquitously deployed cannot share with terrestrial services.

ITU has recognized importance of HDFSS bands by including appropriate language in RR and in Resolutions developed for IMT identifications in 40 GHz band

Dynamic Spectrum Sharing - A win-win for all?

- ◆ **Dynamically shared spectrum may not provide the required certainty to support investment cases for building new satellites & associated ground infrastructure**
- ◆ **E.g. Spectrum sensing techniques have obvious limitations as a tool to manage interference into satellite downlink receivers**
- ◆ **The efficacy of geolocation / databases also requires testing to ensure their ability to control interference sources**
 - ❖ **e.g. Negative experiences with DFS in WiFi**

Is DSS a win-win for all?

Mainly targeted to provide flexibility for terrestrial services, with no direct benefit for satellite services



Thank You