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Message:

To date mmWave bands have mainly been employed for point to point communications. The emergence of mmWave bands for mobile communications is a novel approach where different challenges need to be further evaluated in field environments.

Data on radio propagation at 28GHz measurements is scarce and more measurements are required to better understand the possible range of cells vs the height of the radio units. Impact of rain, foliage, seasonal effects need to be further evaluated to understand the impact on different applications an end user may be using.

The proposed trial will be focused on evaluation 28GHz performance in a real network environment simulating what a possible 5G deployment would look like. The key points the trial would focus on are:

- Evaluation of 28GHz Radio Units: 2 different BTS radio units based on different beam forming techniques are planned to be evaluated. Different RF architectures provide different pros and cons, the trial would enable a the evaluation from a techno-economic point of view and will help outline key essential features required per service type to further enhance end user experience

- 28GHz network topology : High propagation losses inherent to mmWave bands lead to highly dense deployments for mmWave to obtain ubiquitous coverage. Foliage, outdoor to indoor attenuation, blocking probabilities, impact of RF unit height, LOS vs nLOS propagation are all different factors which will aid to define cell ranges and end user equipment (UE) requirements for different type of services. A per service cell topology would assist in better understand density of the deployments required, form factor of RF units required and the characteristics of these.

- End user Experience : Weather, seasonal effects on foliage and blocking are 3 key factors over which further study is required to better understand the impact over different type of applications. Reliability of the link and performance could then further be enhanced via eg. Multi User MIMO, advanced TCP optimization techniques or via Cooperative Multipoint methods.

- Mobility: Key feature of mobile networks for which very limited data is available at for 28GHz. 3GPP standards are targeting UE speeds of up to 500km/h and 0ms interruption time. The supported mobility speeds have a dependency on the BTS/UE RF Beam characteristics along with the end users mobility pattern. The trial would allow to further investigate impact of speed/mobility on the end user in limited mobility scenarios allowing the identification of areas where further enhancement is required

In summary, a 28GHz trial would greatly enable the deployment of mobile network technologies at 28GHz bands and allow the mmWave technology performance to further progress by focusing research and development efforts on the key issues which hinder end user experience and which would allow for higher spectral efficiency gains.