

FCC Registration number: 0032809006

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Why you need experimental license

I am an assistant professor at Michigan State University. My research group is working on NSF and NTIA projects to innovate next-generation wireless communication and sensing systems. To validate our design and implementation, we need to conduct over-the-air experiments for the systems we build. An experimental license is critical for us to carry out the proposed research and deliver the results to our sponsors.

Please provide an engineering analysis and explanation of how you would specifically avoid causing harmful interference to the incumbent EBS and BRS operations,

Our spectrum monitoring results show that a large portion of the spectrum within 2.5GHz-2.69GHz remains unused on the Michigan State University campus (East Lansing, MI), and this unused spectrum can be utilized for our experiments. Spectrum monitoring devices, specifically software-defined radio devices such as USRP N210, will be deployed in our experimental scenarios to monitor the use of the 2.5GHz-2.69GHz spectrum by other/incumbent systems. Before conducting over-the-air radio experiments, we will ensure that the spectrum band is not being used by other systems. We will continuously monitor the spectrum band during our experiments. If radio signals from other systems are detected, we will terminate our experiments to avoid causing interference. To enhance the robustness of our spectrum monitoring mechanism, we will deploy multiple spectrum monitoring devices at different locations to detect the spectrum access of incumbent systems.

Please provide a justification for using the EBS and BRS spectrums, and why the entire spectrum is needed.

We are working on research projects sponsored by the National Science Foundation (NSF) aimed at advancing 5G wireless radio technologies. We wish to evaluate our system prototype on the 4G LTE and 5G NR spectrum band n7, which spans 2500MHz-2570MHz for uplink transmission and 2620MHz-2690MHz for downlink transmission. The success of these research projects will generate new technologies for 5G cellular networks and beyond, providing much better mobile wireless services to people and ensuring the USA's leading position in the competition for 5G technologies. Additionally, the spectrum will be used for educational purposes; students at Michigan State University will be able to access the spectrum to learn about radio communications, wireless networking, and cellular systems.

We need the entire EBS/BRS spectrum because the 5G NR spectrum band n7 requires 2500MHz-2570MHz for uplink and 2620MHz-2690MHz for downlink. Access to the entire spectrum from 2500MHz to 2690MHz is essential for us to evaluate our developed systems and proposed technologies on the 5G NR n7 frequency band.