Telefónica, Nokia and the UPV prove that the 6 GHz band for mobile communications through a pilot project

PUBLISHED NOV 11, 2025
BY TELEFÓNICA

Telefónica, Nokia and the Polytechnic University of Valencia (UPV) have taken a new step in the evolution of mobile communications thanks to a pilot project carried utilizing the upper part of the 6 GHz band (6,425-7,125 GHz, 3GPP n104). This band is considered key by major European telecommunications operators, including Telefónica, to ensure the future of digital mobile connectivity in Europe and the launch of future next-generation services.

This technological milestone took place in the 5G holographic laboratory, created jointly by Telefónica, Nokia and the UPV's iTEAM research institute on the Vera Campus, a pioneering environment in Europe for experimenting with advanced wireless technologies and their applications. The laboratory acts as a test bed for 6G use cases including immersive communications such as extended reality and holography.

The 6 GHz band is critical to ensuring the future of mobile connectivity in Europe, and

offers significantly higher bandwidth than the main 5G band, the 3.5 GHz band, which translates into higher speeds, greater capacity and greater efficiency in network deployment, enabling the introduction of new advanced services.

The 6 GHz band will leverage the use of active antennas with higher-order massive MIMO (i.e., a greater number of transmitting and receiving antennas) than the ones typically used in 3.5 GHz, which allows the signal to be concentrated and coverage to be maintained in urban and suburban environments, as well as significantly increasing network capacity. This compensates for the greater propagation loss

due to the use of a higher frequency.

This combination of increased capacity and efficient coverage with the 6 GHz band provides the opportunity to launch 6G in the future in Europe in a band that is not being used by previous generations of mobile systems.

State-of-the-art equipment was used during the trial, including an active antenna with massive MIMO capabilities from Nokia. The results demonstrated that this band can provide coverage similar to the 3.5 GHz band, taking advantage of current base station locations, allowing for a significant increase in traffic density with efficient network deployment, and offering the performance required for future next-generation services.

With this trial, Telefónica, Nokia and the UPV reinforce their commitment to developing technology for the benefit of the economy and society in Spain and Europe.

Gerardo Rovira, Director of Mobile Access and Network Core at Telefónica Spain, says: ‘This pilot marks a milestone in next-generation network research. Spain is once again at the forefront of technology, demonstrating that the 6 GHz band will not only enable us to respond to growing data demand in the most efficient way, but is also critical to securing spectrum for the future launch of 6G.’

Álvaro Sánchez, Director of Business at Nokia, says: ‘The availability of the full 6 GHz band opens the door to a new era in mobile connectivity. This proof of concept confirms that 6G can be deployed efficiently in 6 GHz, boosting digital connectivity in Spain and enabling the services of the networks of the future.’

David Gómez-Barquero, professor at the UPV, deputy director of iTEAM and head of the laboratory, explains:

> The iTEAM-UPV 5G holographic laboratory is now a European benchmark for the validation of immersive applications, one of the most promising use cases for future 6G. Thanks to this collaboration, our laboratory located in the Polytechnic City of Innovation is positioned as a key infrastructure for the 6G communications of the future and has become one of the first test beds for this technology worldwide.

Part of the team from the European IMAGINE-B5G project, part of the Smart Networks and Services (SNS) programme (Grant ID 101096452), in which UPV, Nokia and Telefónica are participating, collaborated on the pilot.

Press release distributed by Wire Association on behalf of Telefónica, on Nov 11, 2025. For more information subscribe and follow us.

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