PRESS RELEASE

LETI TO DEMONSTRATE NEW MULTICARRIER WAVEFORM FOR 5G NETWORKS ON MINATEC CAMPUS

Six-month Field Trials Will Use Multiservice Transmission at 3.5 GHz TDD Band With 40MHz Bandwidth

GRENOBLE, France – Jan. 10, 2017 – Leti, a research institute of CEA Tech, today announced it will deploy a 5G framework on the MINATEC campus in Grenoble to demonstrate a new post-OFDM *(*orthogonal frequency-division multiplexing) multicarrier waveform.

Leti recently was granted a six-month license from Arcep, France's telecommunications regulatory agency, to run a field trial with multiservice transmission at 3.5 GHz TDD band with 40MHz bandwidth. 3.5GHz might be the first carrier frequency that will be released for 5G.

The post-OFDM multicarrier waveform, a block filtered-OFDM (BF-OFDM), can overcome all shortcomings inherent in actual LTE waveforms and is backward compatible with existing LTE receivers. An innovative medium access control (MAC) layer will demonstrate multiservice and coexistence with primary systems. More advanced features of future 5G networks will also be investigated, such as in-band full-duplex (IBFD). The results of these field trials will enhance Leti's technology-to-system offer for its industrial partners in the context of 5G telecom applications and ad-hoc proprietary radio solutions for vertical sectors.

"4G networks are quickly reaching their limits in capacity and capabilities to address new classes of services, such as massive machine-type connectivity and ultra-low-latency and ultra-reliable communications," said Dimitri Ktenas, Leti wireless lab manager. "Anticipating these challenges, the 3rd Generation Partnership Project (3GPP) began discussing radio access network (RAN) requirements in the fall of 2015 and further discussions produced a consensus that there would be a new, non-backward compatible, radio access technology as part of 5G, targeting a first release in mid-2018."

The new air interface called new radio (NR) targets a single technical framework addressing enhanced mobile broadband (eMBB), massive machine-type communications (mMTC) and ultra-reliable and low latency communications (URLLC). NR also is expected to offer additional support for very high velocities, and these diverse services support a highly flexible waveform allowing very different configurations.

Leti's post-OFDM multicarrier waveform can overcome all shortcomings inherent in classical LTE waveforms, e.g. out-of-band emission and weakness when exposed to asynchronous communications. It is designed to achieve good frequency localization and support simultaneous single-carrier and multicarrier modulations, along with classical multi-antenna, multiple-input, multiple-output (MIMO) solutions. The duration of the elementary communication slot is configurable and can be adapted for low-latency requirements. Leti's solution also keeps backward compatibility with current LTE receiver architecture.

Built on top of the proposed waveform, an access technique has been developed in order to exploit its promising characteristics of frequency localization and agility. This medium access control (MAC) layer also has the ability to adapt so that the channel can be shared with a coexisting system and provide a means to enable enhanced dynamic spectrum access (eDSA).

Leti's field trials also will investigate advanced 5G features such as the promising in-band full-duplex (IBFD) technique that consists in transmitting and receiving in the same frequency band at the same time, theoretically doubling the data rate. However, practical implementations show fewer gains with this technique due to self-interference between signals. Leti's solution merges three technical aspects to successfully mitigate self-interference: antenna isolation, RF cancellation circuits and non-linear digital filtering.

The six-month Arcep license will allow Leti to validate its innovative concepts through 5G experiments in a real-life situation. The over-the-air Leti test platform based on FPGA, ARM processors and agile RF front-end will be used to demonstrate 5G multiservice transmission. The demonstration will mix mobile broadband, cellular Internet of Things (IoT) and low latency transmission for critical applications, and also include multi-user access for investigating eDSA options, and high spectral efficiency gains in-band full duplex (IBFD).

About Leti (France)

As one of three advanced-research institutes within CEA Tech, Leti serves as a bridge between basic research and production of micro- and nanotechnologies that improve the lives of people around the world. It is committed to creating innovation and transferring it to industry. Backed by its portfolio of 2,800 patents, Leti partners with large industrials, SMEs and startups to tailor advanced solutions that strengthen their competitive positions. It has launched 59 startups. Its 8,500m² of new-generation cleanroom space feature 200mm and 300mm wafer processing of micro and nano solutions for applications ranging from space to smart devices. With a staff of more than 1,900, Leti is based in Grenoble, France, and has offices in Silicon Valley, Calif., and Tokyo.

CEA Tech is the technology research branch of the French Alternative Energies and Atomic Energy Commission (CEA), a key player in innovative R&D, defence & security, nuclear energy, technological research for industry and fundamental science, identified by Thomson Reuters as the most innovative research organization in the world. CEA Tech leverages a unique innovation-driven culture and unrivalled expertise to develop and disseminate new technologies for industry, helping to create high-end products and provide a competitive edge.

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