

The faculty of Engineering of the Vrije Universiteit Brussel invites you to attend the public defense leading to the degree of

DOCTOR OF ENGINEERING SCIENCES

of **Sander De Keersmaecker**

The public defense will take place on **Friday 15th November 2024 at 5pm** in room **I.2.01** (Building I, VUB Main Campus)

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TOWARDS MEASUREMENT IMPROVED CALIBRATED FIGURES-OF-MERIT BASED ON MODULATED SIGNALS

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Abstract of the PhD research

Wireless communication systems dominate our world to such an extent that we cannot imagine a world without wireless devices anymore. Aside from 4G and 5G which are already widely used worldwide the scientific and industrial community is preparing for the coming of 6G.

This new generation of communication aims at more in every sense: a faster communication, a lower latency, a better integration of processing in the infrastructure and at its edges must allow to unleash the power of big data and AI and bring these techniques inside our day-to-day world even more than its predecessors.

When looking back at all the earlier transitions from 3G to 4G to 5G, we see that the challenges are not limited to the design of the systems only. To obtain reliable devices despite the explosion of their complexity, we need reliable components and systems. This calls for a more thorough and complete characterization and for new, more informative figures of merit.

This comes at a cost, however. The time needed for the characterization of the devices tends to increase. As the endusers are no longer willing to spend more on next-generation devices, this creates a massive challenge of reducing characterization time while increasing the complexity of the required measurements. This work investigates and proposes various methods and techniques to improve the current state-of-the art calibration techniques to obtain improved figures of merit and to extend the models used for RF systems. The techniques and extensions proposed within this work are validated experimentally on a RF power amplifier to show the improvement compared with state-of-the art results.