



Contribution ID: 50

Type: **not specified**

# End-to-end simulation of satellite-based quantum key distribution

*Thursday, 28 January 2021 09:50 (10 minutes)*

Recent advances in quantum computing and number theory have put a threat on RSA protocols and other modern public-key cryptosystems, challenging the overall fragility of the classical channels. In contrast, quantum key distribution (QKD) offers to restore security and confidentiality of the information even with eavesdropping, through the basic principles of the quantum world. However, there are still a number of problems to be addressed in this field, mainly the trade-off between security, distance, and secret key rates. To address this situation, this work will be namely focusing on a space to ground QKD simulator between a satellite (*Quantsat*) and a ground station, going all the way from hardware-in-loop testing to a mission concept creation, allowing to validate future space missions and experiments to be proposed under this field.

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