## 15th annual conference on Relativistic Quantum Information (North)



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## **Decoherence due to vacuum fluctuations**

Monday, 23 June 2025 15:00 (15 minutes)

The existence of zero-point modes, or the so-called vacuum fluctuations, is one of the fundamental predictions of quantum field theory. From an open quantum system perspective, they constitute an omnipresent and an unavoidable environment of a charged particle. In this talk I would like to discuss if such an environment can lead to observable decoherence and compare it with fundamental decoherence predicted by other theories, concerning the foundations of quantum mechanics. The talk is based on my publications arXiv:2501.17928, Phys. Rev. D 110, 116001 and Phys. Rev. A 107, 062801.

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