

Testing Quantum Mechanics Underground: Collapse models and Pauli Exclusion Principle

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We are experimentally investigating possible departures from the standard quantum mechanics' predictions at the Gran Sasso underground laboratory in Italy.

In particular, with radiation detectors we are searching for signals predicted by the collapse models (spontaneous emission of radiation) which were proposed to solve the “measurement problem” in quantum physics and signals coming from a possible violation of the Pauli Exclusion Principle.

I shall present our recent results and future plans for gravity-related collapse studies and also more generic results on testing CSL (Continuous Spontaneous Localization) collapse models and discuss future perspectives. I shall as well present the VIP experiment with which we look for possible violations of the Pauli Exclusion Principle by searching for “impossible” atomic transitions and the impact of this research in relation to Quantum Gravity models.

Working Group

WG4 - Low-energy high-precision experiment

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