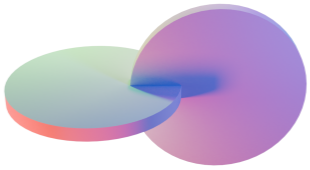

GIREP-EPEC
Transforming physics learning via Research & Practice
LEIDEN, 2025

Contribution ID: **212** Type: **Oral presentation**

Grasping the Invisible: Design and Implementation of Electronic Quantum Dice

Tuesday 1 July 2025 15:30 (20 minutes)

We present research on the development and initial implementation of hands-on demonstration material for quantum entanglement using electronically modified dice. These "Quantum Dice"are equipped with displays, orientation sensors, and wireless communication to simulate basic quantum physics concepts. The system supports various educational scenarios, from basic entanglement demonstrations to quantum key distribution experiments. We will share insights into the design and development of Quantum Dice and preliminary results on the implementation. Attendees will have the opportunity to interact with a prototype of the Quantum Dice and discuss the potential of Quantum Dice to facilitate reasoning about abstract quantum phenomena. Understanding the considerations made in our study can contribute to improving demonstration materials for quantum physics education.

Education level

All ages

Physics topic

Quantum mechanics

Research focus

Active learning

Research method

Educational design research (Qualitative research)

Organizing preference criteria

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Presenter: FOLKERS, Bart (University of Twente)

Session Classification: Parallel oral presentations

Track Classification: Quantum education (QUANT)