

# Theoretical Physics Seminar

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Wednesday, 13/05/2020, 12:15

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## Entanglement by identity, or interaction without ever touching

### **Abstract:**

What is interaction and when does it occur? Intuition suggests that the necessary condition for the interaction of independently created particles is their direct touch or contact through physical force carriers. In quantum mechanics, the result of the interaction is entanglement — the appearance of non-classical correlations in the system. It seems that quantum theory allows entanglement of independent particles without any contact. The fundamental identity of particles of the same kind is responsible for this phenomenon.

Based on:

P. Błasiak & M. Markiewicz, *Entangling three qubits without ever touching*, Sci. Rep. 9, 20131 (2019)  
<https://doi.org/10.1038/s41598-019-55137-3>

T. Altinoluk, M. Kowal, W. Piechocki, J. Skalski