



Contribution ID: 52

Type: **not specified**

Is quantum mechanics “spooky”?

Thursday, 29 August 2019 09:00 (30 minutes)

Nonlocal quantum correlations do not allow communication, but Einstein called them “spooky action at a distance”. The “counterfactual quantum communication”(CQC) of Salih et al. [1] is spookier: Bob can send information to Alice without any physical particle traveling between them! We demonstrate, however, what Salih et al. [1] overlooked: a locally conserved current carries the information. In keeping with [1], this current is massless: it is a locally conserved current of some property of the particle, such as its angular momentum, but not of the particle itself. We previously [2] obtained this result using weak values of angular momentum; here we do without weak values.

[1] H. Salih et al., Phys. Rev. Lett. 110, 170502 (2013)

[2] D. Rohrlich, Y. Aharonov and T. Landsberger, EPJ Web of Conferences 182: 6th International Conference on New Frontiers in Physics (ICNFP 2017), Crete, Greece, August 17-29, 2017, eds. Y. Aharonov, L. Bravina and S. Kabana (Eds.) (2018), 02105.

Primary authors: Prof. AHARONOV, Yakir (Chapman University); Prof. ROHRLICH, Daniel (Ben-Gurion University of the Negev)

Presenter: Prof. ROHRLICH, Daniel (Ben-Gurion University of the Negev)

Session Classification: Plenary Session