Contribution ID: **1031** Type: **Invited talk in the parallel session**

Times of arrival and gauge invariance

Monday, July 5, 2021 5:10 PM (20 minutes)

Arrival-time operators (or observables) describing time-of-flight experiments are naturally constrained by gauge invariance requirements. Surveying the literature on time operators, including POVMs, I will show that a natural generalization of Aharonov-Bohm-Kijowski's arrival-time distribution (referred to as the "standard arrival-time distribution" by some authors) fails to be gauge invariant. In particular, this undermines the associated time-energy uncertainty relations. A direct comparison to the quantum flux distribution, which does not exhibit this flaw, and which does not correspond to a quantum observable (or POVM), will be drawn (its acknowledged drawback concerning the quantum backflow effect notwithstanding). Ref: S. Das and M. Nöth, Proc. R. Soc. A. 477 (2021)

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