Quantum arrival times and operator normalization

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abstract A recent approach to arrival times used the fluorescence of an atom entering a laser illuminated region and the resulting arrival-time distribution was close to the axiomatic distribution of Kijowski, but not exactly equal, neither in limiting cases nor after compensation of reflection losses by normalization on the level of expectation values. In this paper we employ a normalization on the level of operators, recently proposed in a slightly different context. We show that in this case the axiomatic arrival time distribution of Kijowski is recovered as a limiting case. In addition, it is shown that Allcock’s complex potential model is also a limit of the physically motivated fluorescence approach and connected to Kijowski’s distribution through operator normalization.