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Beamsplitters and the Sensitivity to Relativistic Effects in Atom-interferometry[1] ALEXANDER FRIEDRICH, BUTRINT PACOLLI, ERIC P. GLASBRENNER, FABIO DI PUMPO, CHRISTIAN UFRECHT, Ulm University, WOLFGANG P. SCHLEICH, Ulm University & Institute of Quantum Technologies, German Aerospace Center (DLR), ENNO GIESE, Ulm University, QUANTUS COLLABORATION — Recently, quantum-clock interferometry [1] was suggested as a means to measure relativistic effects on the center-of-mass motion in superpositions of internal states. Such proposals combine high-precision quantum metrological techniques to study the fundamental interconnections between relativity and quantum mechanics. Complementary to tests of relativity by the comparison of atomic clocks/frequency standards, quantum-clock interferometry allows for the test of special- and general-relativistic effects with a single but delocalized quantum object. However, the sensitivity with respect to relativistic effects crucially depends [2,3] on the geometry and the specific details of the beamsplitting processes. In our contribution we investigate, elaborate and clarify the link between typical beamsplitting processes in the proposed schemes and the sensitivity to relativistic effects. **References** - [**1**] A. Roura, arXiv 1810.06744, (2018), [**2**] S. Loriani, A. Friedrich et al., Sci. Adv. Vol. 5, no. 10, eaax8966 (2019), [**3**] C. Ufrecht, F. D. Pumpo, A. Friedrich, et al., arXiv 2001.09754 (2020)

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