Constructing quantum localization operators using conformal symmetry LUCAS EARL, JEAN-FRANCOIS VAN HUELE, Brigham Young University — We review the difficulties in merging quantum theory with relativity. In particular, we discuss the issue of localization in quantum mechanics. We introduce the conformal group, a supergroup of the Poincaré group and give its generators and the corresponding algebra. We then illustrate how this allows us to create a space-time localization operator that is consistent with special relativity and quantum theory. We give an explicit expression of the localization operators in 1+1 dimensions and discuss the challenges of generalizing it to higher dimensions.

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