

Abstract Submitted  
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**Time of flight in MUSE at PIM1 at Paul Scherrer Institute<sup>1</sup>**

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The MUSE experiment at PIM1 at Paul Scherrer Institute in Villigen, Switzerland, measures elastic scattering of electrons and muons from a liquid hydrogen target. The intent of the experiment is to deduce whether the radius of the proton is the same when determined from the two different particle types. Precision timing is an important aspect of the experiment, used to determine particle types, reaction types, and beam momentum. Here we present results for a test setup measuring time of flight between prototypes of two detector systems to be used in the experiment, compared to Geant4 simulations. The results demonstrate time of flight resolution better than 100 ps, and beam momentum determination at the level of a few tenths of a percent.

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<sup>2</sup>The MUon proton Scattering Experiment (MUSE)

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