Abstract Submitted for the DNP20 Meeting of The American Physical Society

 β -delayed proton emission from ¹¹Be in effective field theory¹ WAEL ELKAMHAWY, Institut fur Kernyphysik, Technische Universitat Darmstadt, ZICHAO YANG, Department of Physics and Astronomy, University of Tennessee, Knoxville, HANS-WERNER HAMMER, Institut fur Kernyphysik, Technische Universitat Darmstadt, LUCAS PLATTER, Department of Physics and Astronomy, University of Tennessee, Knoxville — We investigate the rare decay of 11 Be into ¹⁰Be + $p + e^- + \bar{\nu}_e$ using Halo effective field theory (Halo EFT), thereby describing the process of beta-delayed proton emission. The branching ratio for this decay mode in ¹¹Be remains an important unsolved problem. Here, we will consider the weak decay of the valence neutron of the halo nucleus ¹¹Be into the continuum for the first time within Halo EFT. We assume a shallow $1/2^+$ resonance in the $^{10}\text{Be}-p$ system with an energy and width consistent with a recent experiment. Our results show that the experimental measurements of branching ratio and resonance parameters are consistent with each other. Thus, no exotic mechanism (such as beyond the standard model physics) is needed to explain the experimental decay rate.

¹Supported by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) - Project-ID 279384907 - SFB 1245, the National Science Foundation, and the Office of Nuclear Physics, U.S. Department of Energy.

Wael Elkamhawy Institut fur Kernyphysik, Technische Universitat Darmstadt

Date submitted: 26 Jun 2020

Electronic form version 1.4