Abstract Submitted
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Nuclear Charge Radii of ^{10,11}B[1] PETER MUELLER, ALESSANDRO LOVATO, R.B. WIRINGA, Physics Division, Argonne National Laboratory, BERNHARD MAASS, THOMAS HUETHER, KRISTIAN KOENIG, JOERG KRAEMER, JAN KRAUSE, WILFRIED NOERTERSHAEUSER, ROBERT ROTH, FELIX SOMMER, IKP, TU Darmstadt, RODOLFO SANCHEZ, GSI, Darmstadt, KRZYSZTOF PACHUCKI, Faculty of Physics, University of Warsaw, MARIUSZ PUCHALSKI, Faculty of Chemistry, Adam Mickiewicz University — We present the first laser spectroscopic determination of the change in the nuclear charge radius in boron isotopes. This is achieved by combining high-accuracy *ab initio* mass-shift calculations and a high-resolution measurement of the isotope shift in the transition frequency from the ground state to the respective excited state in boron atoms. Accuracy is increased by orders of magnitude for the stable isotopes ^{10,11}B compared to previous measurements. The results are used to extract the difference in the mean-square charge radius $<r_c^2>^{11} - <r_c^2>^{10} = -0.49(12)$ fm^2. This value serves as a benchmark for new *ab initio* nuclear structure calculations using the no-core shell model and Green's function Monte Carlo approaches. In addition, this work is the foundation for a laser spectroscopic determination of the charge radius of the proton-rich, short-lived ^{8}B in preparation at Argonne's ATLAS facility.

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