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Charge radius of ^{6}He and Halo nuclei in the Gamow Shell Model GEORGE PAPADIMITRIOU, WITOLD NAZAREWICZ, University of Tennessee, NICOLAS MICHEL, CEA/DSM/IRFU/SPhN Saclay, France, MAREK PLOSZAJCZAK, Grand Accelerateur National d'Ions Lourds (GANIL), JIMMY ROTUREAU, University of Arizona — We calculated the ^{6}He charge radius in the framework of the Gamow Shell Model (GSM). The charge radius reflects both the size of the halo, due to the motion of the α-core around the nuclear center of mass, and also provides us with information on how the several subsystems interact with each other. The motivation for this work was given by the recent very precise measurements of ^{6,8}He, ^{11}Li and ^{11}Be charge radii. The proper treatment of the continuum turns out to be very important for their correct description, and the GSM is a very advanced theory in this direction. For first time in GSM calculations we used a Hamiltonian that is free from spurious center of mass motion, by adopting an intrinsic set of coordinates. Our calculations show that, if we aim to calculate the ^{6}He charge radius right, the total two-body wavefunction should contain an $\sim$ 91% of a p3/2 partial wave. We are convinced that for ^{6}He, the charge radius is very sensitive to i) the halo extent, namely the binding of the system and ii) the p3/2 occupation. This observation will help us to constraint our Hamiltonian and construct the effective interaction in the p and p-sd shells, which will facilitate the description of weakly bound systems.

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