

Abstract Submitted  
for the HAW14 Meeting of  
The American Physical Society

**Behavior of Neutral  $s$ -States in Loosely Bound Nuclei** C.R. HOFFMAN, B.P. KAY, J.P. SCHIFFER, Argonne Natl Lab — We have shown<sup>1</sup> that the variation in binding energy of  $1/2^+$  and  $5/2^+$  states in isotopes of Be to O with  $N = 5$  to 13 can largely be described in simple geometrical terms. The behavior of neutral  $s$ -states is qualitatively different from other  $\ell$  values, showing a tendency to linger below threshold whereas others do not, and nor do proton  $s$ -states. This observation is supported by a wealth of experimental data obtained from radioactive ion beams experiments. While calculations, such as those using the shell model, may reproduce the data, it is likely this simple geometrical effect is subsumed in the effective interactions used. The lingering of neutral  $s$ -states is the same mechanism responsible for neutron halos, and leads one to speculate the existence of heavier halo nuclei close to  $^{78}\text{Ni}$ . This work is supported by the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357.

<sup>1</sup>C. R. Hoffman, B. P. Kay, and J. P. Schiffer, Phys. Rev. C **89**, 061305(R) (2014).

Benjamin Kay  
Argonne Natl Lab

Date submitted: 01 Jul 2014

Electronic form version 1.4