Abstract Submitted
for the APR09 Meeting of
The American Physical Society

$^{9}_{\Lambda}$Be ($\frac{3}{2}^{+}$, $\frac{5}{2}^{+}$) spin-orbit splitting within three-body cluster model[1]

VLADIMIR SUSLOV, IGOR FILIKHIN, BRANISLAV VLAHOVIC, North Carolina Central University, 1801 Fayetteville St., Durham NC, USA — The configuration-space Faddeev equations have been applied to study spin-flip spacing for the first excited states of $^{9}_{\Lambda}$Be hypernucleus considered as a three-body cluster system $\alpha\alpha\Lambda$[1]. In this model the phenomenological potentials for inter-cluster interactions are used [2]. Calculated are the binding energy for the ground and first excited states and ($\frac{3}{2}^{+}$, $\frac{5}{2}^{+}$) spin-orbit splitting for different types of $\alpha\Lambda$ and $\alpha\alpha$ potentials. The overbinding of the system when Ali-Bodmer type $\alpha\alpha$ potential is used and dependence of the interaction on the orbital quantum number $\alpha\Lambda$ are discussed. The spin-orbit component of $\alpha\Lambda$ interaction is taken by the potential [3] having one range Gaussian form. Our results are in a qualitative agreement with those obtained with the combined RGM and Faddeev cluster calculations [3]. Cluster model that includes a repulsive three cluster $\alpha\alpha\Lambda$ potential [4] was also studied.
1. O. Hashimoto, H. Tamura, Prog.Part. Nucl. Phys. 57, 564 (2006); 2. E. Cravo, A.C. Fonseca, Y. Koike, PRC 66 (2002) 014001; 3. http://xxx.lanl.gov/find/nucl-th/1/au:+Fujiwara_Y/0/1/0/all/0/1 Y. Fujiwara, at al. PRC70, 047002 (2004); 4. M. Shoeb, PRC74, 064316 (2006).

[1]This work is supported by NSF CREST award, HRD-0833184.

Vladimir Suslov
North Carolina Central University

Date submitted: 09 Jan 2009 Electronic form version 1.4