

Abstract Submitted  
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**Double magicity of N=Z nuclei near the rp-process path discerned** MADAN M. SHARMA, Kuwait University, Kuwait, JAGDISH K. SHARMA, St. Johns College, Agra, India — We have investigated the experimental isotope shifts in Kr nuclei near the proton drip-line within the framework of the deformed relativistic Hartree-Bogoliubov theory. In this work, we have attempted to answer the question as to why the charge radius of  $^{72}\text{Kr}$  shrinks significantly as against its expected swelling in approaching the proton drip line. It is shown that it happens due to the shell closure observed at  $N=Z=36$  in deformed space, which compactifies the charge radius of  $^{72}\text{Kr}$ . Consequently, we have discerned that N=Z rp-process nuclei  $^{68}\text{Se}$ ,  $^{72}\text{Kr}$ ,  $^{76}\text{Sr}$  and  $^{80}\text{Zr}$  exhibit shell closures both at the proton and neutron numbers in the deformed space with the consequence that pairing correlations for protons and neutrons vanish. This lends a double magicity to these nuclei. Thus, N=Z rp-process waiting-point nuclei are shown to exhibit a magic character similar to that shown by the r-process waiting-point nuclei in the neutron-rich region. A significant number of nuclei in rp-process region are also shown to exhibit neutron magicity at  $N=34, 36, 38,$  and  $40$  in the deformed space.

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