Contribution ID: **78** Type: **online talk**

ΛΛ pairing effects in spherical and deformed multi-Λ hyperisotopes

Thursday 30 June 2022 15:45 (15 minutes)

The ΛΛ pairing effects in spherical and deformed multi-L hyperisotopes are investigated in the framework of the Skyrme-Hartree-Fock approach employing a d pairing force with the pairing strength of L hyperons being 4/9 of that for nucleons. For spherical hyperisotopes, the occurrences of magic numbers -S = 2, 8, 18, 20, 34, 58, 68, and 70, which are attributed to a Woods-Saxon-like Λ hyperon potential, are evidenced by the sudden drop of 2Λ separation energies and the vanishing pairing gaps and pairing energies. The results are compared with equivalent ones in recent Hartree-Fock-Bogoliubov and relativistic-Hartree-Bogoliubov calulations. For the deformed hyperisotopes, more possible Λ hyperon magic numbers -S = 4, 6, 10, 14, 26, 30, and 32 are found based on the analysis of the single-particle energy levels, and are all sensitive to the quadrupole deformation β2. The steps of the 2Λ separation energies are accordingly smaller than in spherical hyperisotopes, and the possibilities for pairing are consistently reduced.

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Session Classification: 4; Thu-IIIa