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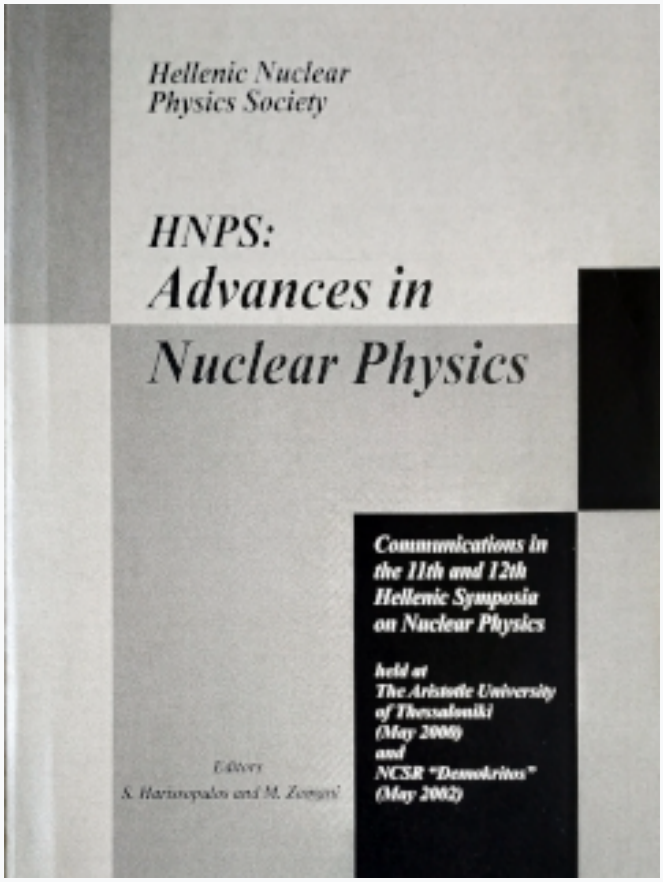

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A simplified response function formalism for medium-heavy Λ hypernuclei

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There is a variety of spectra for Λ hypernuclei (from light to heavy) which contain many peaks ranging from the deepest orbits to the surface ones.

An approach is presented for the calculation of the bound state specrum of Λ hypernuclei, where the cross section is expressed through the response function. This was achieved in the framework of the Green function method with a square well optical potential using the plane waves. An analytic treatment was made for the prominent peaks with the contribution of only the valence neutron-hole series and a Gaussian folding was obtained for the rest spectrum. The method was applied mainly to the (π^+, K^+) medium to heavy Λ hypernuclei and also to the $(K^-$in-flight$, \pi^-)$ Λ hypernuclear spectra (with respect to their differences).

The results are satisfactory compared to the experimental values. The main advantage of the proposed model is its simplicity. Possible extensions and improvements of this method are also suggested.