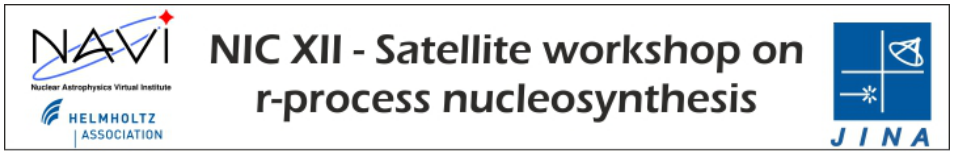

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Single particle levels in Sn-131 and Sn-133 on the path of r-process nucleosynthesis

Saturday, 4 August 2012 16:30 (30 minutes)

Single-particle resonant states embedded in the continuum for ^{131,133}Sn, in the vicinity of the neutron capture threshold for ^{130,132}Sn(n,γ), are calculated by the analytical continuation of the coupling constant (ACCC) approach within the relativistic mean field (RMF) theory framework. Our fully self-consistent RMF calculations using the NL3 effective interaction,
predict single-particle bound levels near the Fermi surface, consistent with Nature report for ^{133}Sn and recent measurement for ^{131}Sn. For the first time, the level structure of single-particle resonant states in ^{131,133}Sn up to 3 $\sim$ 4 MeV above the neutron capture threshold are investigated. Our RMF+ACCC+BCS approach determines a level spacing that is too sparse for typical level density formulation used to calculate capture cross section with a Hauser-Feshbach (HF) formalism.

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