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

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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, $\gamma$ ), 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 <sup>133</sup>Sn and recent measurement for <sup>131</sup>Sn. For the first time, the level structure of single-particle resonant states in <sup>131,133</sup>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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