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Chiral symmetry restoration deduced in precision spectroscopy of pionic atoms

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The latest results from the spectroscopy of deeply bound pionic Sn 121 atoms, performed at RIBF, RIKEN, are reported. The binding energies and widths of the pionic orbitals were determined, and the pion-nucleus interaction was deduced with unprecedented precision. It was found, after extensive analysis, that the chiral condensate at nuclear saturation density is reduced by a factor of 60+-3% (T. Nishi, K. Itahashi et al., Nature Phys. (2023) doi:10.1038/s41567-023-02001-x).
We also discuss the current status of systematic spectroscopy of pionic Sn isotopes and future plans to deduce the density dependence of the chiral condensate.

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