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King Fits: Global bounds on light new physics from isotope shifts

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Isotope shift frequencies figure among the most precisely measured physical quantities but are highly challenging to predict from first principles. In recent years King plots emerged as powerful data-driven tools that eliminate the theoretical uncertainties on the Standard Model nuclear parameters and can place bounds on new light mediators between neutrons and electrons.

We develop a framework for fits to isotope shift data that allows to take into account more data than conventional King-plot methods and discuss the significance of the King plot bounds for the search for light new physics.

Auteurs principaux: KIRK, Fiona (PTB Braunschweig); KIRK, Fiona

Orateurs: KIRK, Fiona (PTB Braunschweig); KIRK, Fiona

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