



Contribution ID: 18

Type: **Talk**

Nonlinear isotope-shift effects in highly-charged ions

Wednesday, 20 July 2022 11:50 (25 minutes)

Precision isotope-shift spectroscopy of ions provides a very promising tool to probe the fundamental limits of Standard Model and to search for hypothetical “fifth-force” interactions. The analysis of the isotope-shift experimental and theoretical results can be performed most conveniently by means of the so-called King plot (KP). In this plot, the normalized frequency shifts of two (or even more) atomic transitions are displayed against each other for a series of isotopes of the same element. While KP is linear to the leading order, its non-linearity can be attributed to higher-order Standard Model effects or to a fifth-force interaction, or to a combination of both. The separation of these two contributions to the KP non-linearities remains an open and very challenging question. In order to attack it, one has to understand well the higher-order Standard Model corrections to the electronic structure of ions. In my presentation I will review recent theoretical advances in the analysis of (higher-order) field-shift and recoil isotope-shift corrections. Special attention will be paid to robustness of the KP analysis to the uncertainties of these theoretical predictions.

Primary authors: SURZHYKOV, Andrey (Physikalisch-Technische Bundesanstalt (PTB) and Technische Universität Braunschweig); Dr YEROKHIN, Vladimir (Physikalisch-Technische Bundesanstalt); Dr VIATKINA, Anna (Physikalisch-Technische Bundesanstalt)

Presenter: SURZHYKOV, Andrey (Physikalisch-Technische Bundesanstalt (PTB) and Technische Universität Braunschweig)

Session Classification: Session 9