Contribution ID: **2** Type: **Poster Presentation**

Nuclear structure corrections to the Lamb-shift in light-muonic atoms

Spectroscopy experiments in muonic atoms allow for the extraction of the nuclear charge radii of the lightest nuclei with unprecedented precision. The measurement of the Lamb shift in muonic hydrogen [1] and the related emergence of the proton radius puzzle have motivated an experimental campaign devoted to other light muonic atoms, such as muonic deuterium [2] and helium [3]. For these systems, nuclear polarizability effects are the largest source of uncertainties [4] and consequently the bottle-neck for exploiting the experimental precision. Combining advanced few-body techniques and effective field theories developed for studies of nuclear structures and reactions [5], we are able to provide precise determinations of the nuclear polarizability effects in light-muonic atoms and to reliably quantify the associated uncertainties [6]. I will review our recent calculations and present an outlook for the future.

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Session Classification: Poster Session