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## Probing $P,T$ -violation with molecules in high charge states

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Polar molecular ions in extreme charge states have the potential to merge advantages that highly-charged *atomic ions* and neutral *polar molecules* offer, when performing precision tests of fundamental physics. As we have discussed in Ref. 1, one can expect to benefit from enhanced relativistic effects and compressed level structures on the one hand and large internal fields with considerable enhancements of  $P,T$ -odd effects on the other hand in specifically tailored molecular ions.

In this talk, general trends in the stability of highly-charged molecules are outlined, level structures and their dependence on the charge state in iso-electronic sequences of diatomic molecules [2] are presented and sensitivities to various sources that induce a violation of parity ( $P$ ) and time-reversal ( $T$ ) symmetry are discussed.

[1] C. Z252;lch, K. Gaul, S. M. Giesen, R.F. Garcia Ruiz, R. Berger, *arXiv:2203.10333*.

[2] C. Z252;lch, K. Gaul, R. Berger, *Isr. J. Chem.*, **63** (2023) e202300035.

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