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## High precision calculations of the hyperfine structure in Li-like bismuth

Investigations of the hyperfine splitting (HFS) in highly charged ions can provide tests of quantum electrodynamics (QED) in the strongest electromagnetic field presently available. The simultaneous study of the HFS in H- and Li-like ions is required, since the Bohr-Weisskopf effect, dominating the theoretical uncertainty, is almost cancelled in the specific difference of the HFS values (cf. [1]). Ab-initio calculations of the screened QED corrections are needed to decrease the uncertainty of the theoretical prediction for this specific difference. Recently, the HFS in Li-like bismuth was observed in laser spectroscopy experiment at the experimental storage ring (ESR) in GSI (cf. [2]). In the present work the screened diagrams containing electric and magnetic vacuum-polarization loops have been evaluated to all orders in  $\alpha Z$  [3, 4, 5]. The internal-loop contributions are rigorously approached including the Uehling and the Wichmann-Kroll terms. The accuracy of the theoretical prediction for the specific difference of the hyperfine splitting values in H- and Li-like bismuth is improved.

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