

COEFFICIENT OF THE ANAPOLE MOMENT'S ENHANCEMENT IN SiO⁺ MOLECULE

The anapole moment is an electromagnetic moment appearing in one of the terms of the multipole expansion of the vector potential of the current distribution [1], which occurs inside atomic nuclei with nonzero spin. An important property of the anapole moment is that it arises as a result of interactions that violate spatial invariance, therefore, its study is necessary for the development of the theory of spatially odd interactions in atomic nuclei.

To date, the value of the anapole moment with a sufficiently large error has been experimentally obtained in the ¹³³Cs atom [2] and a restriction on the ¹⁹F nucleus in the ¹³⁸Ba¹⁹F molecule has been obtained from above [3], several more experiments are also planned [4,5]. A promising solution seems to be the search for an anapole moment in diatomic molecules due to the presence of opposite parity rotational levels close in energy in them [6,7], therefore, the ²⁹Si¹⁶O⁺ molecule was studied in this work.

In this work, within the framework of completely relativistic approaches to the description of multielectronic systems, the value of the enhancement of the anapole moment of the ²⁹Si nucleus in the SiO⁺ molecule was calculated, which is necessary to extract the value of the anapole moment in this molecule.

Keywords: anapole moment, P-parity, SiO⁺ molecule.

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¹ Saint Petersburg State University, Russia, 199034, St Petersburg, Universitetskaya Embankment, 7-9.

² Petersburg Nuclear Physics Institute named by B.P. Konstantinov of National Research Centre “Kurchatov Institute” (NRC “Kurchatov Institute” — PNPI), Russia, 188300, Leningradskaya Oblast, Gatchina, Orlova Roscha, 1.