

THE INFLUENCE OF THE EFFECTIVE IONIZATION  
POTENTIAL AND INITIAL MOMENTUM  
ON THE BARRIER-SUPPRESSION IONIZATION RATE  
IN A CIRCULARLY POLARIZED LASER FIELD

M. Kurtović<sup>1</sup>, V. Petrović<sup>2</sup>, I. Petrović<sup>3</sup>

*Barrier suppression ionization rate for noble gases is analyzed considering the initial momentum of the ejected photoelectron and the influence of the ponderomotive and the Stark shifts on the ionization potential, for a low-frequency, circularly polarized laser field. In order to accomplish it, three different approaches are used: a critical field, an ion charge, and the Airy function. The results are compared across the approaches used and with the other theoretical and experimental results. Good agreement is found. The research shows that the ponderomotive potential and the Stark shift affect the rate differently in these approaches, while the initial momentum of the ejected photoelectron significantly influences the ionization rate regardless of the approach.*

**Keywords:** transition rate, photoionization, barrier-suppression, circularly polarized laser field.

*Introduction.* The ionization of atomic systems in an intense laser field is one of the most fundamental quantum processes that have been investigated extensively, both theoretically and experimentally, in last decades. As a result, many interesting nonlinear optical phenomena have emerged [1–6]...

Поступила в редакцию 8 мая 2023 г.

После доработки 20 августа 2023 г.

Принята к публикации 21 августа 2023 г.

---

<sup>1</sup> Medical School “Two heroes”, Novi Pazar, 36300 Serbia; e-mail: kurtovicmaida@gmail.com.

<sup>2</sup> Department of Physics, Faculty of Science, University of Kragujevac, Kragujevac, 34000 Serbia; e-mail: violeta.petrovickg@gmail.com.

<sup>3</sup> Department in Kragujevac, Academy of Professional Studies Šumadija, 34000 Kragujevac, Serbia; e-mail: kgivanpetrovic@gmail.com.