

Stability of positronium negative ion in non-ideal classical plasmas

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May 5, 2020

Abstract

The stability of positronium negative ion embedded in non-ideal classical plasmas has been investigated theoretically within the framework of Rayleigh-Ritz variational method by computing its ground state energy quite accurately. A pseudopotential, derived from a solution of Bogolyubov's hierarchy equations, has been used to describe interactions among the charged particles in plasma. A large basis set is utilized to compute accurately various quantities, such as binding energy, cusp values, annihilation rate, associated with the ground state of the ion. A detailed study has been made on the effects of non-ideality of plasma on those quantities. In particular, special emphasis is given to determine the ranges of plasma screening parameters within which the ion remains stable.

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