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(G) (POS-74) The hypothesis of a new fundamental physical constant (the limit electric potential) and outline of its theoretical exploration

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Numerous experimental observations have demonstrated that fundamental charges are quantized. Consequently, point charge models are extensively applied in foundational physical theories such as electromagnetism and quantum field theory, achieving significant success.
However, electromagnetic theoretical calculations indicate that the energy of a point charge diverges, a phenomenon recognized as a longstanding fundamental challenge in physics.
This paper proposes the hypothesis of a new fundamental physical constant, the limit electric potential constant. The author discusses the basis for resolving the divergence problem of point charge electric field energy if this hypothesis holds true.
Furthermore, the paper suggests that the limit electric potential constant could be a fundamental physical constant of equal importance to the speed of light and Planck's constant, potentially expanding Maxwell's equations and modern space-time theory.
The author has undertaken theoretical derivations, one of which includes the derivation of new Maxwell's equations. Within this new framework of electromagnetic theory, the infinite energy problem of point charges is completely resolved, and new physical effects are predicted for experimental verification.

Keyword-1

point charge energy diverges

Keyword-2

a new physical constant

Keyword-3

new Maxwell's equations

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