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Abstract

In this article, we propose a new modified projection and contraction algorithm for approximating solutions of a variational inequality problem involving a quasi-monotone and Lipschitz continuous mapping in real Hilbert spaces. We incorporate the technique of two-step inertia into a single projection and contraction method and prove a weak convergence theorem for the proposed algorithm. Our weak convergence theorem requires neither the prior knowledge of the Lipschitz constant nor the weak sequential continuity of the associated mapping. Under additional strong pseudomonotonicity, the R -linear convergence rate of the two-step inertial algorithm is derived. Finally, some numerical examples are given to illustrate the effectiveness and competitiveness of the proposed algorithm in comparison with some existing algorithms in the literature.

Keywords Two-step inertial · Double step · Projection and contraction · Variational inequality · Weak and linear convergence

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✉ **Abubakar Adamu**
abubakaradamu@neu.edu.tr

Chibweze Christian Okeke
chibweze.okeke@wits.ac.za

Thembinkosi Eezy Kunene
t177166@students.wits.ac.za

Dilber Uzun Orsahin
dilber.azunorsahin@neu.edu.tr

¹ School of Mathematics, University of the Witwatersrand, Private Bag 3, Johannesburg 2050, South Africa

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² Operational Research Center in Healthcare, Near East University, Nicosia, Turkish Republic of Cyprus

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³ Chongqing Normal University, Chongqing 400047, China

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⁴ Faculty of Medical and Health Sciences, University of Sharjah, Sharjah, UAE