Topological **M**ethods in **N**onlinear **A**nalysis
Volume 60, No. 2, 2022, 457–474
DOI: 10.12775/TMNA.2022.015

AN ACCELERATED VARIANT OF THE PROJECTION BASED PARALLEL HYBRID ALGORITHM FOR SPLIT NULL POINT PROBLEMS

Yasir Arfat — Poom Kumam — Muhammad Aqeel Ahmad Khan
Parinya Sa Ngiamsunthorn

Abstract. In this paper, we consider an accelerated shrinking projection based parallel hybrid algorithm to study the split null point problem (SNPP) associated with the maximal monotone operators in Hilbert spaces. The analysis of the proposed algorithm provides strong convergence results under suitable set of control conditions as well as viability with the help of a numerical experiment. The results presented in this paper improve various existing results in the current literature.

1. Introduction

Let $\mathcal{H}_1$, $\mathcal{H}_2$ be given Hilbert spaces. To introduce our problem, we first consider the Split Inverse Problem [15, Section 2] which is

$$\Psi \in \mathcal{H}_1 \text{ such that } \Psi \text{ solves } \mathrm{IP}_1, \text{ and } \widetilde{\Psi} = \hbar\Psi \text{ solves } \mathrm{IP}_2.$$

2020 *Mathematics Subject Classification.* 47H05, 47H10, 47J25, 49M30, 54H25.
Key words and phrases. Parallel hybrid algorithm; inertial extrapolation; strong convergence; null point problem.
Y. Arfat was supported by the Petchra Pra Jom Klao Ph.D. Research Scholarship from King Mongkut's University of Technology Thonburi, Thailand (Grant No. 16/2562).
P. Kumam acknowledge the financial support provided by the Center of Excellence in Theoretical and Computational Science (TaCS-CoE), KMUTT. Moreover, this project is funded by National Council of Thailand (NRCT) under Research Grants for Talented Mid-Career Researchers (Contract no. N41A640089).