## 1. Comment

This field of research is interesting and important but the importance of the authors' contribution in the manuscript is not clear.

## Response

The following text has been added in the Conclusions section: *“Overall, the main contributions of the proposed method are: the velocity calculation mechanism, the propagation among parallel computing units, and the termination rule represents an innovative technique in improving the performance of the algorithm. ”*

## 2. Comment

The weakness of the PSO algorithm is not clearly discussed in the manuscript. Since the authors aim to rectify the shortcomings of method by the proposed combination, clear discussion of its weakness is essential.

## Response

The following text has been added at the end of Introduction:

*“The main disadvantages of the PSO method are its tendency to converge quickly to a local minimum in some complex or high-dimensional objective functions, and its performance heavily depends on the initial particle distribution, as incorrect values may lead to suboptimal solutions. The proposed method overcomes these issues and aims to improve the algorithm's performance in terms of speed and reduced consumption of computational resources. In general, any optimization method can be parallelized, ensuring the ability to utilize fewer computational resources and saving time in the resolution process.”*

## 3. Comment

There are other approaches, improved parallel Particle Swarm Optimization. These approaches should be discussed and their results must be compared with those from the authors' approach.

## Response

We have included two additional methods in the experimental results

1) The parallel version of the GALIB algorithm

2) The Parallel Global Best-Worst Particle Swarm Optimization Algorithm

## 4. Comment

Figure 8 is not cited in the manuscript text.

## Response

The figure is now cited at the end of subsection 3.2

## 5. Comment

The PSO algorithm should be explained in detail not only in formulation but also in approach.

## Response

The following text has been added in Section 2:

*“The approach of the underlying algorithm is based on representing the problem as a swarm of particles, where each particle represents a candidate solution in the Euclidean search space. During the optimization process, the particles move in the search space based on their individual experience and also on social interactions. Using these two influences, the particles adjust their velocities and positions during the iterations of the algorithm. The parallel version of the underlying article also promotes social interactions among sub-swarms using different propagation schemes.”*

## 6. Comment

Please add an appropriate flowchart to the proposed algorithm that exactly indicates its procedure.

## Response

A diagram that shows the overall algorithm have been added in subsection 2.1

## 7. Comment

The backgrounds of this manuscript are optimization techniques and intelligent algorithms. Thus, the Introduction and/or related work section could be extended and incorporates additional discussions on the topics of optimization techniques and intelligent algorithms, e.g:

Yassami, M., Ashtari, P. A novel hybrid optimization algorithm: Dynamic hybrid optimization algorithm. Multimed Tools Appl (2023). https://doi.org/10.1007/s11042-023-14444-8

Optimal chiller loading by improved parallel particle swarm optimization algorithm for reducing energy. International Journal of Refrigeration

https://doi.org/10.1016/j.ijrefrig.2022.01.014

and other new papers.

## Response

The references to the recent works have been added in the Introduction section.

## 8. Comment

Explain various application domains where the proposed approach can be used.

## Response

The following text has been added in the Introduction section of the revised manuscript:

“

*Parallel optimization methods can be utilized in various application domains, enabling rapid resolution of complex problems. Some of these domains include:*

1. *Engineering and Design: Optimizing parameters for improved performance in engineering systems like aircraft, automobiles, and machinery.*
2. *Computer Science: Optimizing complex algorithms and computational tasks.*
3. *Biology and Pharmaceuticals: Addressing problems like DNA analysis and calculating multiple protein interactions.*
4. *Economics and Finance: Automating the optimization of intricate models.*
5. *Energy Optimization: Optimizing energy consumption in energy networks.*
6. *Climate Change: Optimizing complex climatic models and weather prediction.*
7. *Telecommunications: Designing efficient communication networks and optimizing network performance and bandwidth management.*
8. *Policy Decision-Making: Finding optimal solutions for problems like transportation routing and sustainability policies.*

*By applying parallel optimization techniques in these diverse fields, researchers and practitioners can efficiently tackle complex challenges and achieve optimal solutions more effectively.*

“

## 9. Comment

In the experiments, this paper compares the proposed method with GA (1992). It would be better to compare with more recent works.

## Response

We have included two additional methods in the experimental results

1) The parallel version of the GALIB algorithm

2) The Parallel Global Best-Worst Particle Swarm Optimization Algorithm