



Fig. (2). GM value. **Notes:** The GM value diagram shows the GM values after finishing supplying in 5 different replenishment schemes.

is not particularly desirable, but it corresponds to the other indicators are relatively best. After the multi-objective function improved, calculation solution trend by using iterative was relatively stable. Improved equation can be considered to meet the requirements of the target value and suitable for replenishment target value theory decision problem and verify the rationality of the function (9).

For a clear analysis of ship's trim value and GM after supplying under different replenishment scheme and put the result into Figs. (1, 2).

From Figs. (1, 2), the result of GM shows a good performance. While the first two cases the value of the trim is not particularly desirable, but it corresponds to the other indicators are relatively best. After the multi-objective function improved, calculation solution trend by using iterative was relatively stable. Improved equation can be considered to meet the requirements of the target value and suitable for replenishment target value theory decision problem and verify the rationality of the function (9).

CONCLUSION

For liquid cargo replenishment scheme decision problem, when a supply require comes specific supply scheme should be given out. From mathematical intelligent optimization algorithm's point of view, use PSO algorithm to iterative for calculating best result of fitness function. Then solve the problem from the mathematically. Thus overcoming the contradictions between the time complexity and precision of Solutions of engineering solutions. In order to increase the accuracy of calculations, the multi-objective function was improved. Through the calculations of different kinds replenishment working conditions based on improved function in section 5, and the simulation results were compared with phase-out results were better. It verified the

fitness and correctness of improved function presented in this paper.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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