REVIEW
on the article by V.I. SIVTSEVA, A.V. SAVVIN, AND V.V. GRIGORIEV
ROSSBY WAVE APPROXIMATION USING TWO-STRATEGY ADAPTIVE ARTIFICIAL BEE COLONY ALGORITHM

In this paper, the authors study approximation of Rossby waves using real world data. The main idea of the paper is to find an efficient approximation method and computational strategy for predicting dynamic processes in atmosphere. The specific data presented in the paper can be approximated by Rossby waves; however, the parameters are unknown. In general, because we do not know the frequencies, this problem is challenging as it requires many harmonics. The authors use ideas as in L1 minimization and setup a sparsity promoting minimization problem, which is difficult to solve. They propose Two-Strategy adaptive Artificial Bee Colony (TSaABC) algorithm with hard thresholding. The data are taken from the Aura (MLS) satellite. By solving the inverse problem involving minimizing the data discrepancy and L1-norm of harmonic amplitudes, the method achieves a good accuracy and sparsity in the large dictionary of harmonics. The implementation of hard thresholding allows for a reduction in dimensionality, which enhances computational efficiency. The paper introduces a novel strategy and algorithms for solving challenging problem. This work is very different from previous approaches in the field and uses sparsity ideas and proposes a novel algorithm. I recommend the paper for publication.

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