

基于改进 PSO 的盲源分离与重力固体潮信号分析

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摘要: 提出一种改进粒子群优化算法来优化独立分量分析中的目标函数.改进的粒子群优化算法通过将粒子进行分类,使得不同种类粒子可以根据自身特点进行寻优,这就保证了粒子具有一定的自适应能力,使得粒子可以跳出局部最优.同时,改进算法中加入的随机速度可以进一步确保粒子能够跳出局部最优,快速找到最优粒子.提出的算法,提高了算法的收敛速度及盲源分离效果.同时,由实验结果可知,此改进算法可将重力固体潮信号分解为相互独立的信号分量,具有一定的应用研究价值.

关键词: 盲源分离; 独立分量分析; 粒子群优化算法; 自适应

Gravity Tide Signal Based on Blind Source Separation

with Improved Particle Swarm Optimization

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Abstract: This paper presents an improved particle swarm optimization algorithm to optimize the objective function of ICA. The improved PSO in the paper divides the particles into three kinds. According to their own characteristics, every kind of particles has different method to update their speed and position adaptively. The method proposed in the paper can search the optimal target globally in ICA. Results of the simulation experiment show that the improved PSO can solve the objective function of the global optimization problem in ICA effectively, and improves the blind source signal effectively. From the results, we can see that the method proposed in the paper is useful to gravity tide signal.

Key words: blind source separation; independent component analysis; particle swarm optimization; adaptive

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