

Interactive comment on “Inversion of Residual Gravity Anomalies using Tuned-PSO Technique” **by Ravi Roshan and Upendra Kumar Singh**

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First of all we are very thankful to reviewer Dr. Sanjay Prajapati for his critical and constructive comments which helped a lot to improve the quality of the manuscript. We have tried to furnish all comments raised by the reviewer as follow. If still you have some comments, we are always ready to fulfill. Those comments for improving the manuscript would be appreciable.

Page No -2.

Reply on comment number1: In Traditional PSO, controlling parameters i.e. weighting factor (w) and cognitive coefficient (c_1) and social coefficient (c_2) is generally taken as 0.9, 1.4 and 1.4 which cannot be the fixed parameter for every case. This may give unsatisfactory results. Tuned PSO is PSO method in which tuned parameters are

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selected. For selecting the suitable parameters, number of exercises have been done and try to find the best combination of the parameters and these tuned parameters gives better results than traditional PSO. The proposed method also helps to reduce the number of local minima.

Page No- 3.

Reply on comment number 1: The statement given in page-3 (line number 72-74) does not have significant importance for my work and that has been removed.

Reply on Comment number 2 & 3: We have corrected unit of all parameters raised by the reviewer. Line number (80 – 85) has been rewritten and highlighted.

Page No- 4.

Reply on comment number 1 & 2: The parameters (inertia weight, cognitive coefficient c_1 and social coefficient c_2) have been selected on the basis of faster convergence of the algorithm with minimum error. (The explanation regarding this has been given in page 4, line no. 127-131 and page 5, line no. 148-154).

Page No- 5.

Reply on comment number 1, 2 & 3: The sentence is rewritten in simple and comprehensive way in line number (158-165) and highlighted that can easily understand by the reader

Reply on comment number 4 & 5: In order to check the efficacy and applicability of proposed algorithms, two types of synthetic gravity anomalies in each of the geometrical body has been taken (1) the gravity anomalies are generated by the forward modeling using equation (1) known as the synthetic noise free data and (ii) the gravity anomalies is added with 10% of white Gaussian noise known as synthetic gravity data with 10% noise.

Reply on comment number 6: Both are different. Synthetic data is the gravity anomaly

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lies generated by the forward modeling using equation (1) whereas Simulated means computed by the proposed algorithm. The sentence has been rewritten (line 163-165) and highlighted.

Page No - 6.

Reply on comment number 1 & 2: Yes, the synthetic curve means synthetic gravity anomaly curve. The sentence has been rewritten in line number (171-174) and highlighted.

Reply on comment number 3 & 4: With the help of table 2 and 3 we want to show rms error computed for synthetic data with 10% noise is increased in compare of rms error computed for synthetic data without noise. Sentence has been rewritten in line number (177-180) and highlighted.

Reply on comment number 5 & 6: The comment raised by the reviewer for the statement has been removed.

Reply on comment number 7 & 8: The statement has been rewritten. Reference has been included in line number (188-189) and highlighted.

Reply on comment number 9: The sentence has been rewritten in line number (192-193) and highlighted.

Reply on comment number 10: (i) In this paper, our aim is to see the applicability of the proposed algorithms on gravity field and (ii) Since proposed method is Global optimization method that provides the optimal with very less error and this method does not require any initial guess whereas other method (discussed in manuscript) is local optimization method needs good initial guess.

The comments raised by reviewer regarding resolution of the depth of the ore body, this method may resolve depth at any extent if data itself reflects the signature of the causative ore body.

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Reply on comment number 11 & 12 & 13: The statement has been rewritten (198-204) and highlighted.

Page No - 7.

Reply on comment number 1: The word has been corrected highlighted in line number (219).

Please also note the supplement to this comment:

<http://www.geosci-instrum-method-data-syst-discuss.net/gi-2016-26/gi-2016-26-AC1-supplement.pdf>

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., doi:10.5194/gi-2016-26, 2016.

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