**ABSTRACT**

All over the world millions of people were affected by speech disorders in which one of the significant speech disorders is stuttering. Over the past two decade immense number of research is going on in the field of fluency disorder, and still it is necessary to enhance the analysis of stuttering disorder regional-wise. The speech signal tempo will vary with each individual where the specific fluctuation in the velocity of stutter speech is typical and it is due to the intervals in the speech rate which has a significant difference in normal stuttered speech. In this paper, Regularity of Speech Energy (RSE) was analyzed as normal, moderate and severe through Tamil speaking stuttered dataset. The analysis was done based on the energy threshold obtained during the irregular release of energy which is henceforth analyzed using optimal thresholding based on Particle Swam optimization (PSO) and Synergistic Fibroblast optimization (SFO) techniques. In order to evaluate the experimental analysis on RSE, statistical measures such as mean, standard deviation, Mean Square Error (MSE) and Root Mean Square Error (RMSE) were calculated. The experimental results of analysis on RSE have proved that stuttered speaker's signal releases low energy when compared to the normal speaker where the optimal threshold energy enhances the detection of hidden speech energy.