

**AimSizer/LNO.0019**

**Improved Simulated Annealing Neural Network Algorithm and Its Application in Vibration Analysis**

**Abstract:** The traditional back-propagation algorithm (BP algorithm) neural network model was improved combined with simulated annealing algorithm and the best retain principle. A new improved neural network model was proposed and applied to the analysis of particle collision damping. Training simulation results showed that the improved algorithm compared with the traditional BP algorithm, LM algorithm had a higher reliability, faster convergence speed. Using the trained simulated annealing neural network model, the excitation frequency, fill rate, RMS amplitude and other parameters of particle collision damping were simulated. The relationship between the particle size, fill rate and amplitude RMS of the system in the low-frequency phase was obtained.

**Key words:** particle damping; simulated annealing method; Powell algorithm; laser particle size analyzer; particle size analyzer; aimsizer; as-2011 micron laser particle size analyzer; as-2012 submicron laser particle size analyzer

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