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遗传投影寻踪插值模型在电能质量综合评估中的应用

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摘要
对电能质量进行综合量化评估是衡量电能质量优劣和制定电价的主要依据之一。文章提出将基于遗传算法的投影寻踪理论应用于电能质量评估，利用投影寻踪理论将多指标问题转化为单一投影指标问题，采用全局收敛的格雷码加速遗传算法优化投影方向，根据最佳投影值及其对应等级的关系构建了用于电能质量综合评估的遗传投影寻踪插值模型。实例计算结果表明运用该模型得到的电能质量综合评估结果更客观、合理，证明了该模型的正确性和优越性。

关键词 电能质量综合评价；插值；遗传算法；投影寻踪

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Application of Genetic Projection Pursuit Interpolation Model on Power Quality Synthetic Evaluation

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Abstract
The synthetic quantified evaluation of power quality is one of the principal foundations in power quality appraisal and electricity energy pricing. It is firstly proposed by the authors to apply the projection pursuit theory based on genetic algorithm in power quality evaluation, i.e., to transform multi-indices problem into single projection index problem by use of projection pursuit method. The projection direction is optimized by genetic algorithm speeded up by global convergent Gray code, and according to the relation between optimal projection values and corresponding grades a genetic projection pursuit interpolation model (GPPIM) for synthetic evaluation of power quality is built. Case study results show that the synthetic evaluation result of power quality from the built model is more objective and rational, so the correctness and superiority of the built model are verified.

Key words synthetic evaluation of power quality；interpolation technique；genetic algorithm；projection pursuit

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