

## 煤层气发动机稳态空燃比前馈控制脉谱生成

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关键词: 煤层气发动机 空燃比 前馈控制 静态模型 脉谱

摘要: 基于煤层气发动机进气系统的物理特性,采用平均值、多项式和模糊神经网络建模方法,建立了用于稳态空燃比前馈控制的递阶模型,并通过该模型生成了三维初始控制脉谱图。借助于辨识的过量空气系数自适应神经网络模糊推理系统(ANFIS)模型,进行了静态空燃比前馈控制仿真。利用前馈控制模型生成的数据,检验了实际控制效果。结果表明,前馈控制模型具有良好的预测能力,模型最大和平均预测误差分别小于8%和5%。Based on the physical characteristics of the intake system in a coal-bed gas engine equipped with two-valve type gas mixer, a hierarchical model for steady state air fuel ratio feed-forward control was established using mean value and polynomial regression analysis as well as fuzzy-neural network modelling methods. A 3D original control MAP graph was generated from the model. By means of an identified adaptive neural fuzzy inference system (ANFIS) model of the excess air factor, the simulation of static state air fuel ratio feed-forward control was carried out. Subsequently, the actual engine control experiment was performed with data produced by the feed-forward control model. The results show that the feed-forward control model has good predication ability. Maximal and average prediction errors of the model are less than 8% and 5%, respectively.

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