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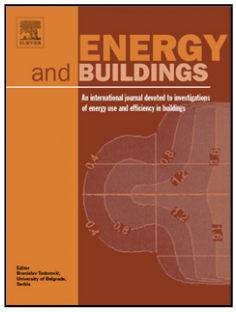

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A robust online fault detection and diagnosis strategy of centrifugal chiller systems for building energy efficiency

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Abstract

The fault detection and diagnosis (FDD) of centrifugal chillers is always a complex difficulty in HVAC systems. This paper develops an online fault detection and diagnosis strategy based on non-linear radial basis function (RBF) to online detect and diagnose the fault of centrifugal chillers. The RBF is adopted to develop the reference feature parameter (FP) models. Exponentially-weighted moving average (EWMA) residual control charts of FP is used to detect the faults. A rule-based diagnostor is developed to online identify the fault. Seven common faults are taken in account for typical centrifugal chillers. The FDD strategy proposed was validated by using the experimental data from the ASHRAE RP-1043 project and the operating data of a centrifugal chiller in an office building of Hong Kong. The test results show that the RBF-EWMA method has achieved significant improvements in accuracy and reliability by comparing

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