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## Experimental Analysis of Energy Efficient Building Air Conditioning System Using Fuzzy Logic Controller

*R. Karunakaran, R. Parameshwaran, A. Senthilkumar, S. Iniyar*

### Abstract

The present work is focused on investigating the thermal comfort and indoor air quality (IAQ) in buildings through the use of energy efficient air conditioning (A/C) system. In this context, a combined variable air volume (VAV) and variable refrigerant volume (VRV) system is developed and tested with different ventilation strategies for summer and winter design conditions. The proposed system is controlled by the intelligent fuzzy logic controller that enhanced the overall system performance. The proposed system is tested under fixed ventilation, demand controlled ventilation (DCV) and combined DCV and economizer cycle (EC) ventilation that ensured better indoor thermal comfort and IAQ without compromising on the energy efficiency. The test results infer that the proposed air conditioning system controlled by fuzzy logic methodology yield a maximum of 34% and 52% of per day energy savings in summer and winter design conditions respectively. The test results for each technique in terms of thermal comfort, IAQ and energy savings potential are presented.

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