

An Analysis Thermal Environment In Tropical Lecture Theatres Using Computational Fluid Dynamics

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ABSTRACT

This study assessed the thermal environment of selected lecture theatres in a tropical educational institution. Field measurement, subjective assessment and CFD simulation were applied for the study of thermal comfort in the lecture theatres under different occupancy levels. Computational fluid dynamics (CFD) were applied to obtain temperature and velocity distribution within the lecture theatres. Predicted results were then validated using empirical results. It was found that thermal comfort perception is affected by occupancy level. The highest thermal acceptability rate occurs at the fully occupied lecture theatres. The predicted and actual mean vote showed that the lecture theatres were over cooled. In addition, raising the temperature in the lecture theatre to 24°C produces a thermally comfortable environment yet reducing the amount of energy consumed by the cooling system.