

Thermal Comfort Investigation Based on Predicted Mean Vote (PMV) Index Using Computation Fluid Dynamic (CFD) Simulation: Case Study of University of Brawijaya, Malang-Indonesia

Authors : Dewi Hardiningtyas Sugiono

Abstract : Concerning towards the quality of air comfort and safety to pedestrians in the University area should be increased as Indonesia economics booming. Hence, the University management needs guidelines of thermal comfort to innovate a new layout building. The objectives of this study is to investigate and then to evaluate the distribution of thermal comfort which is indicated by predicted mean vote (PMV) index at the University of Brawijaya (UB), Malang. The PMV figures are used to evaluate and to redesign the UB layout. The research is started with study literature and early survey to collect all information of building layout and building shape at the University of Brawijaya. The information is used to create a 3D model in CAD software. The model is simulated by Computational Fluid Dynamic (CFD) software to measure the PMV factors of air temperature, relative humidity and air speed in some locations. Validation is done by comparing between PMV value from observation and PMV value from simulation. The results of the research shows the most sensitive of microclimatic factors is air temperature surrounding the UB building. Finally, the research is successfully figure out the UB layout and provides further actions to increase the thermal comfort.

Keywords : thermal comfort, heat index (HI), CFD, layout

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