

Simulation Study on Comparison of Thermal Comfort during Heating with All-Air System and Radiant Floor System

Authors : Shiyun Liu

Abstract : Radiant heating systems work fundamentally differently from air systems by taking advantage of both radiant and convective heat transfer to remove space heating load. There are rare studies on differences of heating systems between all-air system and radiant floor system. This paper uses the method of simulation based on state-space to calculate the indoor temperature and wall temperature of each system and shows how the dynamic heat transfer in rooms conditioned by a radiant system is different from an air system. Then this paper analyses the changes of indoor temperature of these two systems, finding out the differences between all-air heating system and radiant floor heating system to help the designer choose a more suitable heating system.

Keywords : radiant floor, all-air system, thermal comfort, simulation, heating system

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