

## Thermal Comfort Characteristics in an Enclosure with a Radiant Ceiling Heating and Floor Air Heating System

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**Abstract :** An environmental friendly or efficient heating & cooling systems attract a great attention, due to the energy or environmental problems. Especially the heat balance of human body is about 50% influenced by radiation exchange in built environment. Therefore, a thermal comfort characteristics in a radiant built environment need to be accessed through the development of an efficient evaluation method. Almost of Korean housings use traditionally the radiant floor heating system. A radiant cooling system attracts also many attention nowadays in the viewpoint of energy conservation and comfort. Thermal comfort characteristics in an enclosure with a radiant heating and cooling system are investigated by experiment, thermal sensation vote analysis and mean radiant temperature simulation. Asymmetric radiation between radiant heating ceiling and air heating system in 9 points of room is compared with each other.

**Keywords :** radiant heating and cooling ceiling, asymmetric radiation, thermal comfort, thermal sensation vote

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