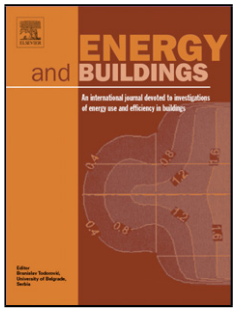

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Using radiant cooling desk for maintaining comfort in hot environment

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Highlights:

- A series of experiments on radiant cooling desk was conducted in hot environment.
- Radiant cooling desk decreased warm sensation and improved thermal comfort.
- The high surface temperature of radiant panels reduced condensation risk.
- Radiant cooling desk has large potential for saving energy.

Abstract: This study aims to investigate thermal comfort of subjects with a new type of radiant cooling desk in hot environment. A series of experiments was conducted in an experimental room at 28, 30 and 32℃ in summer. Totally, 20 subjects (10 males and 10 females) participated in the experiments. During the test, subjective responses and some parameters of radiant cooling desk were recorded. The obtained results indicate that radiant cooling desk reduced warm sensation and increased both comfort and acceptability of subjects in hot environment, while it weakened the preference for cooler environment. Radiant cooling desk mainly cooled upper body parts and this effect was more significant in warmer environment. Besides, subjects were free from draft risk but they still wanted higher velocity in hot environment. In addition, the surface temperature of radiant panels at 28, 30 and 32℃ were 22.8, 23.9 and 25.5℃ respectively, which lowered condensation risk. And the cooling capacity of radiant cooling desk at 28, 30 and 32℃ were 89.9, 104.4 and 130.7 W, respectively. Since radiant cooling desk