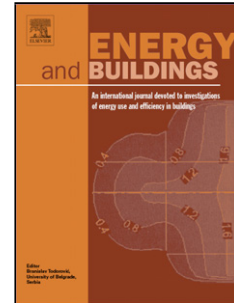


Accepted Manuscript

Title: Experimental and numerical investigation of the correlation between radiative and convective heat-transfer coefficients at the cooled wall of a real-sized room

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PII: S0378-7788(15)30254-1
DOI: <http://dx.doi.org/doi:10.1016/j.enbuild.2015.09.013>
Reference: ENB 6133

To appear in: *ENB*

Received date: 1-3-2015
Revised date: 15-8-2015
Accepted date: 9-9-2015

Please cite this article as: O. Acikgoz, O. Kincay, Experimental and numerical investigation of the correlation between radiative and convective heat-transfer coefficients at the cooled wall of a real-sized room, *Energy and Buildings* (2015), <http://dx.doi.org/10.1016/j.enbuild.2015.09.013>

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Experimental and numerical investigation of the correlation between radiative and convective heat-transfer coefficients at the cooled wall of a real-sized room

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Highlights:

- 1- An experimental setup was established for radiant cooling systems.
- 2- Measurements were recorded at different surface temperatures and flow rates.
- 3- Heat transfer coefficients over the radiant cooled wall were calculated.
- 4- Experimental data were validated by numerical and theoretical data.
- 5- A new correlation that reveals the relation between the coefficients was derived.

Abstract: Radiant heating and cooling systems can be utilized in association with renewable energy sources and are currently being used in newly constructed homes, as well as in buildings where heating and cooling systems have been converted from conventional systems to these systems. Thus, for a radiant system, the fundamental characteristic parameters, such as radiative, convective and total heat-transfer coefficients, carry the utmost importance. In the present study, these coefficients were determined through measurements from a test facility as well as numerical case studies.

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