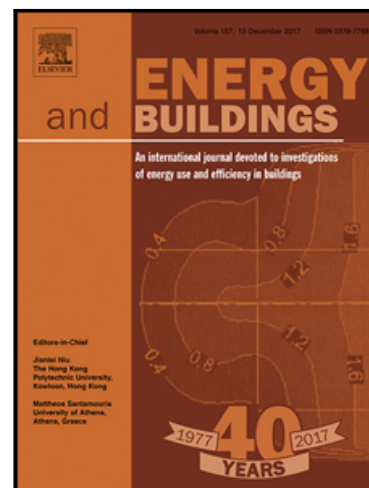


Accepted Manuscript

Description and ASSESSMENT of the BUILDING SURFACE
TEMPERATURE modelling IN LASER/F

L. Roupioz , P. Kastendeuch , F. Nerry , J. Colin , G. Najjar ,
R. Luhahe

PII: S0378-7788(17)33990-7
DOI: [10.1016/j.enbuild.2018.05.033](https://doi.org/10.1016/j.enbuild.2018.05.033)
Reference: ENB 8574



To appear in: *Energy & Buildings*

Received date: 8 December 2017
Revised date: 8 April 2018
Accepted date: 19 May 2018

Please cite this article as: L. Roupioz , P. Kastendeuch , F. Nerry , J. Colin , G. Najjar , R. Luhahe ,
Description and ASSESSMENT of the BUILDING SURFACE TEMPERATURE modelling IN LASER/F,
Energy & Buildings (2018), doi: [10.1016/j.enbuild.2018.05.033](https://doi.org/10.1016/j.enbuild.2018.05.033)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

DESCRIPTION AND ASSESSMENT OF THE BUILDING SURFACE TEMPERATURE MODELLING IN LASER/F

ROUPIOZ L.^{1*}, KASTENDEUCH P.¹, NERRY F.¹, COLIN J.¹, NAJJAR G.¹, LUHAHE R.¹

¹ Laboratoire ICube (UMR 7357, Unistra/CNRS/ENGEEES/INSA), 300 boulevard S. Brant, 67400 Illkirch, France.

*Corresponding author. laure.roupioz@onera.fr, Tel.: +33 5 62 25 28 83

Abstract: LASER/F is a physical thermo-radiative model designed to simulate the 3D surface radiative and energy exchanges in urban environments, which can provide, among other physical variables, detailed distribution of building surface temperature over time. This paper aims at presenting in details the algorithms behind the estimation of the surface temperature and assessment results. The assessment relies on a set of in-situ measurements acquired over the facade of a large building on the university campus of Strasbourg (France) during a continuous 36 hours period in July 2016, combining a thermal camera FLIR SC655, a non-imaging multi-spectral thermal radiometer Cimel Climat and two albedometers (Kipp & Zonen). The adequate model settings are defined following a preliminary sensitivity analysis of LASER/F aiming at quantifying the impact of facade material structure and properties on final results, and at finding the proper balance between accuracy and computation time. LASER/F is then used to model the building surface temperature kinetic over the data acquisition period. Results demonstrate the ability of LASER/F to adequately reproduce the behavior and magnitude of building surface temperature (RMSE 1.31°C), even with a coarse 3D representation of building geometry and surrounding environment, and highlight the need for accurate description of building material properties.

Keywords: thermo-radiative model, building surface temperature, urban simulation, thermal images, LASER/F

Download English Version:

<https://daneshyari.com/en/article/6727288>

Download Persian Version:

<https://daneshyari.com/article/6727288>

[Daneshyari.com](https://daneshyari.com)