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Abstract

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Keywords: Dynamic Photovoltaics, Multi Functional Envelope, BIPV, Adaptive Shading

1. Introduction

- Buildings are responsible for significant energy consumption
- Recent developments in the efficiency and costs of thin film BIPV technologies allow for integration into the facade
- Dynamic building envelopes can save energy by controlling direct and indirect radiation into the building, while still responding to the occupants desires
- Previous research
- Review of ASF Simulation Paper
- Sensitivity of the Simulation on the building energy performance
- This paper extends this work by running the simulation to a variety of building archetypes in Zurich

2. Methodology

The methodology runs the ASF Simulation. It will be briefly reviewed here for Simplicity

2.1. Solar Radiation Evaluation

2.2. Building Simulation Model

2.3. Sensitivities

Within this framework, three sensitivities will be analysed:

Building Envelope: The building envelope is characterised in the RC model as H_w. ...

Infiltration: The infiltration rate is modified in the H_{ve} component of the RC model...

Thermal Capacitance: The thermal capacitance of the mass is denoted as C_m in the RC model. It...

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2.4. Analysis of Archetypes

- Building Archetypes are taken from CEA tool and evaluated within the ASF Framework
- Table of Input Parameters for the different buildings

3. Results

3.1. Influence of Envelope Resistance

3.2. Influence of Infiltration

3.3. Influence of Thermal Mass

3.4. Archetype Evaluation of the ASF

4. Discussion and Conclusion

5. Acknowledgments

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