# Review of: "Influence of a City Block on ES-CFD Coupled Analysis"

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Potential competing interests: No potential competing interests to declare.

The study "Influence of a City Block on ES-CFD Coupled Analysis" investigates the impact of surrounding buildings on indoor thermal conditions using an innovative ES-CFD (Energy Simulation-Computational Fluid Dynamics) coupled analysis. This approach combines energy simulation and fluid dynamics to provide a more detailed understanding of heat transfer and ventilation in urban settings. Focusing on factors such as solar radiation, ventilation, and condensation risk, the study offers valuable insights, especially regarding the dew point temperature's role in assessing condensation risk on building surfaces. The research aims to inform the development of more accurate and practical simulation tools for urban climate analysis.
However, the study has several limitations. Its simplified urban environment model omits complex microclimate variations (Shade and Solar Exposure Variability, Heat Islands and Surface Material Properties, Wind Patterns and Urban Wind Flow, **…)**, which could affect results in real-world settings.

Additionally, the study lacks consideration for different building materials and insulation configurations, which could influence heat retention and condensation risk. The research is computationally intensive, requiring substantial resources, and would benefit from optimizations to make the approach more practical for broader application (Focus high-density mesh grids only on critical areas, such as near building surfaces that are exposed to varying solar radiation or wind interactions, the study primarily examines peak noon temperatures, the simulation could use coarser time steps during stable conditions, Instead of running a full CFD analysis inside the entire building, simpler energy simulation models could be used indoors to estimate convective heat transfer and indoor temperature changes, with CFD reserved for outdoor wind flow and localized effects, …) and around zones where indoor-outdoor ventilation flows are likely. Future work incorporating the study could use machine learning models trained on prior CFD simulations to predict thermal or airflow outcomes in certain recurring conditions; these surrogate models could then provide quick, approximate values in similar scenarios, reducing the need to re-run full CFD simulations for every condition.