

## Final report of UHH-KU fund for ECR program

### Section 1

<b>Applicant (at the time of application, i.e. supervisor of the visiting researcher or the visiting researcher themselves)</b>	
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### Section 2

<b>Visiting researcher (if different from the above)</b>	
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### Section 3

<b>Host researcher</b>	
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### Section 4

<b>Summary of the project (approx. 200 words)</b>
<p>We propose to combine the strength of the numerical simulation model with advantages of the local climate zone classification, ultimately targeting at an improved spatially explicit estimation of urban heat flux. As the first step for achieving the goal, we simulated the wind turbulence and heat flux in business districts of Osaka, and Hamburg and compared the results because the characteristics of building arrangements between Osaka and Hamburg were quite different. For example, the maximum building height and building height variability were larger in Osaka than that in Hamburg. We used a building-resolving numerical simulation model for simulations and SAGA-GIS software for making a building distribution map. We conducted heating experiments in which all building surfaces emitted heat flux, considering the anthropogenic heat from buildings. The features of the wind speed, momentum flux, heat flux and potential temperature differed in between Osaka and Hamburg. The upper air in Osaka was effectively warmed because in Osaka, large building height variability disturbed wind flow and horizontal heat diffusion and building density at higher levels increased a number of heat sources. We plan to conduct the simulation in the other areas of different LCZ.</p>