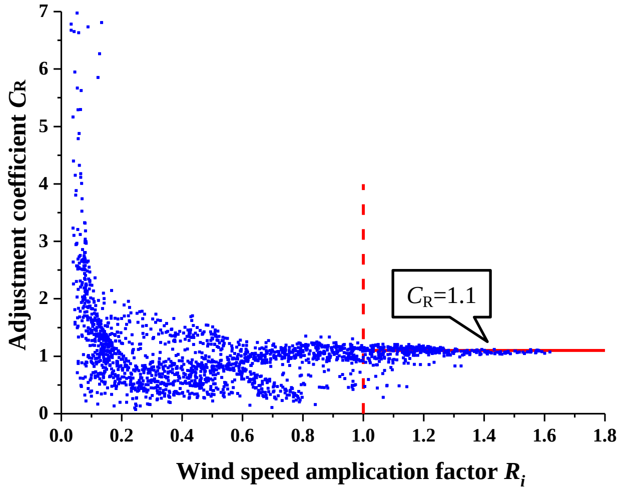

Fig. 12 Adjustment coefficient C_R for the wind speed amplification factor R_i

Based on the above statements, the average value of the C_R is determined to be 1.1, and the R_i acquired by the wind environment experiment should be multiplied by the C_R so as to be used in the wind comfort assessment. Therefore, the link of the pedestrian-level R_i between the sub-configuration and the full model is established.

5. Conclusions

In this paper, the pedestrian-level wind environment on the outdoor platforms of a thousand-meter-scale megatall building is studied via the combination of wind tunnel tests and CFD simulations.

The pedestrian-level wind speed amplification factor R_i on the Platform 2 of the sub-configuration acquired by the CFD simulations agree well with the experimental data both in the whole distribution tendency and in the values, so feasibility and credibility of the CFD simulations are validated. Based on the validation, the most unfavorable outdoor platform of the full model with the poorest wind environment is studied via the CFD simulations, and it is determined to be the Platform 4 using the quartiles method in descriptive statistics of the R_i. Besides, an averaged adjustment coefficient C_R=1.1 for the R_i is introduced to establish the link of the sub-configuration and the full model, so the R_i for the real megatall building can be calculated by multiplying the experimental data and the above adjustment coefficient C_R, which can be employed for assessment of the pedestrian-level wind comfort and wind danger of the thousand-meter-scale megatall building.

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