atmosphere

Article

Implicit Definition of Flow Patterns in Street Canyons—Recirculation Zone—Using Exploratory Quantitative and Qualitative Methods

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Supplementary material

Basic flow and dispersion statistics for the street canyons U5AR067, U5AR050 and U5AR025 U_{ref} = 5m·s^{-1} and AR = 0.67, 0.50 and 0.25

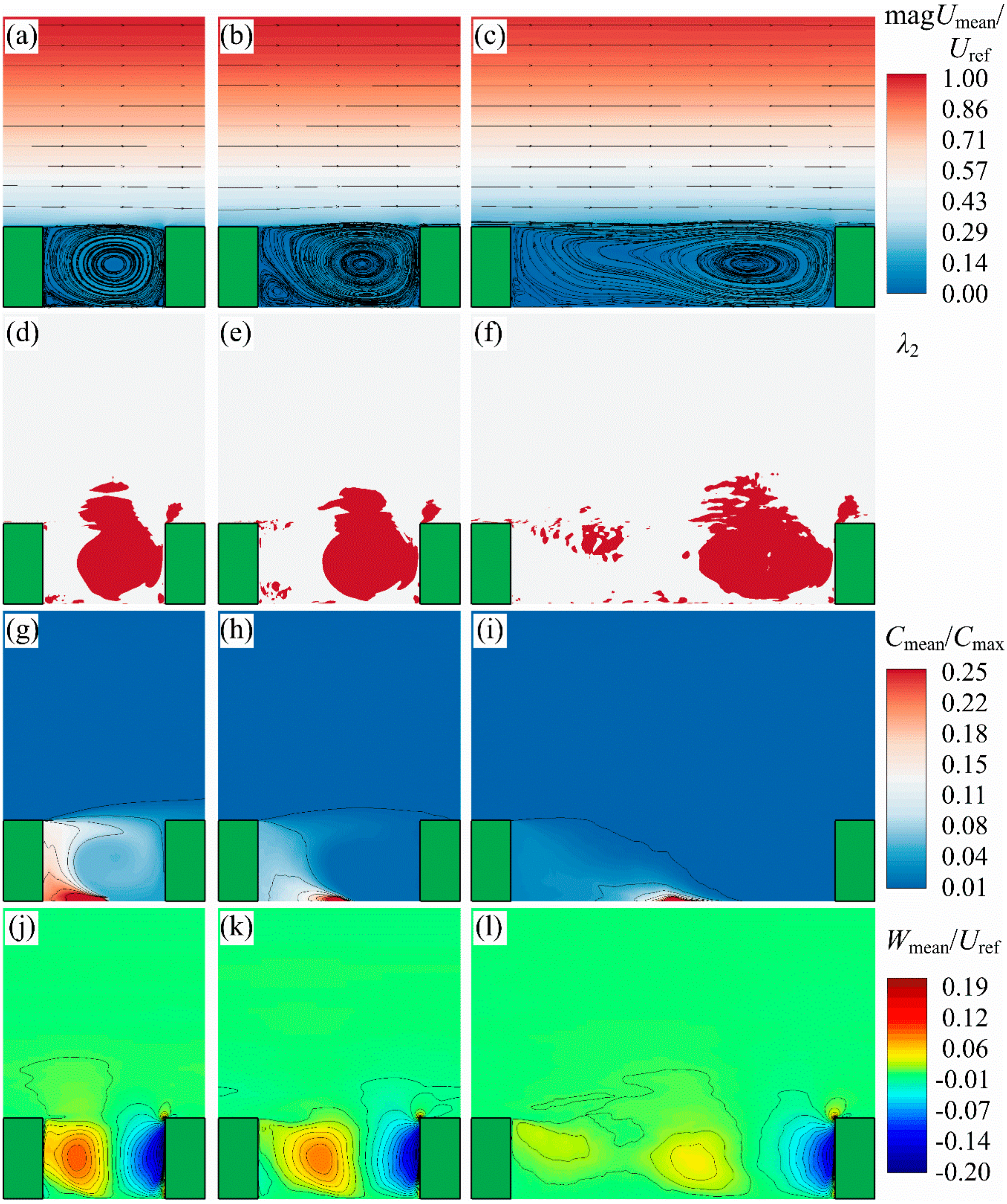

Figure S1. Basic flow and dispersion statistics for the street canyons U5AR067, U5AR050 and U5AR025 (left to right): (**a**–**c**) the average dimensionless magnitude of velocity mag U_{mean}/U_{ref}; (**d**–**f**) the $\lambda 2$ vortex identification criterion; (**g**–**i**) the normalised concentration C_{mean}/C_{max}; (**j**–**l**) the dimensionless vertical velocity W_{mean}/U_{ref}; the street canyon orientation is the same as Figure 1.

Results of the k-means clustering with four clusters, for U_{mean}/U_{ref} and W_{mean}/U_{ref}, for the street canyons U5AR067, U5AR050 and U5AR025

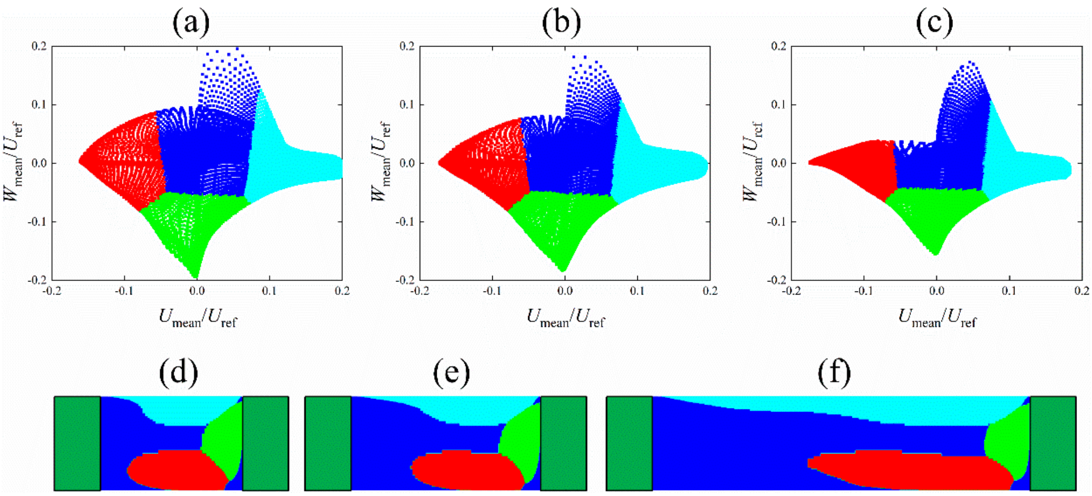

Figure S2. Results of the k-means clustering with four clusters, for U_{mean}/U_{ref} and W_{mean}/U_{ref}, for the street canyons U5AR067, U5AR050 and U5AR025 (left to right): (**a**–**c**) scatter plots; (**d**–**f**) contour plots; the street canyon orientation is the same as Figure 1.

The best of the studied equations that were derived in the search for suitable relationships between cluster area and *AR*.

Table 1. Compilation of the regression analysis results, showing the equations with the highest R^2 explored.

Areas Covered by Each Region as a Function of *AR*
$REG3 + REG4 = 0.3346 \cdot AR + 0.183$, $R^2 = 0.8835$
$REG3/REG1 = 12.292 \cdot AR \cdot REG2 \cdot REG4 + 0.0221$, $R^2 = 0.9899$
$REG4/REG1 = 0.7505 \cdot AR \cdot REG4/REG2 + 0.2802$, $R^2 = 0.8805$
$REG3/REG1 = 0.687 \cdot AR - 0.0578$, $R^2 = 0.9842$
$REG2/REG3 = 0.7904 \cdot AR^{-0.901}$, $R^2 = 0.9908$
$REG1/REG3 = 12.321 \cdot \exp(-2.136 \cdot AR)$, $R^2 = 0.9706$
$REG3/REG2 = 12.208 \cdot AR \cdot REG1 \cdot REG4 + 0.0618$, $\mathrm{R}^2 = 0.9778$
$REG3/REG1 = 0.2275 \cdot AR \cdot REG4/REG2 + 0.0977$, $R^2 = 0.9501$
$REG1/REG3 = 1.6464 \cdot AR^{-1.133}$, $R^2 = 0.9682$
$REG2/REG3 = 3.8093 \cdot \exp(-1.644 \cdot AR)$, $R^2 = 0.9309$
$REG1 \cdot REG2 = -0.9116 \cdot AR \cdot REG2 \cdot REG4 + 0.0969$, $R^2 = 0.9508$
$REG1 \cdot REG2 = -0.0428 \cdot AR \cdot REG4/REG3 + 0.1242$, $R^2 = 0.9146$
$REG1 = -3.9942 \cdot AR \cdot REG3 \cdot REG4 + 0.5261$, $R^2 = 0.903$
$REG4/REG2 = 2.2004 \cdot AR \cdot REG3/REG1 + 0.9829$, $R^2 = 0.8913$
$REG3/REG2 = 0.6842 \cdot AR \cdot REG1 \cdot REG4 + 0.4111$, $R^2 = 0.8703$
$REG1/REG3 = -8.0787 \cdot AR + 8.9855$, $R^2 = 0.8665$
$REG1 = -0.3188 \cdot AR + 0.6093$, $R^2 = 0.8598$
$REG4 + REG1 = -0.1359 \cdot AR + 0.7565$, $R^2 = 0.836$
$REG2/REG3 = -2.6263 \cdot AR + 3.1755$, $R^2 = 0.7967$
$REG3 + REG4 = 0.3346 \cdot AR + 0.183$, $R^2 = 0.8835$
$REG3/REG1 = 12.292 \cdot AR \cdot REG2 \cdot REG4 + 0.0221$, $R^2 = 0.9899$
$REG4/REG1 = 0.7505 \cdot AR \cdot REG4/REG2 + 0.2802$, $R^2 = 0.8805$
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