Notebook for tornado thesis

Yong WANG

Contents

Chapter 1

Definitions

1.1 Swirl Ratio

Chapter 2

Wind-Driven Rain

2.1 Overview

Euler-Euler frame in WDR simulationS. Huang and Q. Li 2011: rain is regarded as a continuum similar to wind rather than as a single raindrop as it is treated in the existing WDR simulation methods. A similar group of conservation equations with wind, including the mass conservation and momentum conservation equations, were established for rain based on the concept of phase and phasic volume fraction in the same Euler coordinates as wind. Then, the equations for rain can be solved in the same way as for wind.

Continuum hypothesis for raindropsS. H. Huang and Q. S. Li 2010: Continuum hypothesis is valid mathematically in consideration of the relatively small mean inter-particle distance with an order of 0.1 m in most cases, as compared with the macroscopic size of a concerned WDR field (usually in the order of 10 m).

Bibliography

[1] S. H. Huang and Q. S. Li. "Numerical simulations of wind-driven rain on building envelopes based on Eulerian multiphase model". In: *Journal of Wind Engineering and Industrial Aerodynamics* 98.12 (2010), pp. 843–857. DOI: 10.1016/j.jweia.2010.08.003.

[2] S. Huang and Q. Li. "Large Eddy Simulations of Wind-Driven Rain on Tall Building Facades". In: *Journal of Structural Engineering* 138.8 (2011), pp. 967–983. DOI: 10.1061/(ASCE)ST.1943-541X.0000516.