Contribution ID: **229** Type: **poster**

Spreading and absorption of impinging droplet on porous stones

Thursday, 19 September 2013 12:30 (2 hours)

Wetting by wind-driven rain (WDR) refers to rain droplets carried by the wind and impinging on the building façade. WDR water is a main agent of deterioration of building materials, such as surface soiling, algae formation, salt damage and frost damage, which becomes an important issue when retrofitting old or historical buildings by adding insulation, planning energy efficient cities, and doing assessment of soiling of facades and leaching of harmful biocides and nanoparticles from buildings. The understanding of phenomena of single water droplet, such as spreading, splashing, bouncing, absorption, evaporation, film forming and run-off can lead to better estimation of WDR load on buildings within urban environments. We report on the wetting and absorbing dynamics of a 4.3 ul deionized water droplet impinging on porous building stones, Pietra Serena, Meule, and Savonnieres. This study examines the influence of materials and drop impact velocity on the spreading and absorbing characteristics from the measurement of contact diameter between droplet and stones and penetration depth of drop into materials. The movement of waterfront and variation of moisture contents into different porous stones were investigated using neutron radiography. We found that penetration depth of impinging droplet is function of impact velocity of droplet and main pore size of stones.

Primary author: Mr LEE, Jae Bong (ETH Zürich)

Co-authors: Dr DEROME, Dominique (Empa); Prof. CARMELIET, Jan (ETHZ / Empa)

Presenter: Dr DEROME, Dominique (Empa)

Session Classification: Poster session II and lunch