Geophysical Research Abstracts
Vol. 14, EGU2012-14350, 2012
EGU General Assembly 2012

Velocity dependant splash behaviour

C. A. E. Hamlett (1), N. J. Shirtcliffe (2), G. McHale (1,4), S. Ahn (3), S. H. Doerr (3), R. Bryant (3), and M. I. Newton (4)

(1) School of Science and Technology, Nottingham Trent University, Clifton Lane, Nottingham, NG11 8NS, United Kingdom, (2) echnology and Bionics, Hochschule Rhine-Waal, Landwehr 4, 47533 Kleve, Germany, (3) College of Science, Swansea University, Singleton Park, Swansea, SA2 8PP, United Kingdom, (4) School of Computing, Engineering and Information Sciences, Northumbria University, Newcastle upon Tyne, NE1 8ST, United Kingdom

Extreme soil water repellency can occur in nature via condensation of volatile organic compounds released during wildfires and can lead to increased erosion rate. Such extreme water repellent soil can be classified as superhydrophobic and shares similar chemical and topographical features to specifically designed superhydrophobic surfaces. Previous studies using high speed videography to investigate single droplet impact behaviour on artificial superhydrophobic have revealed three distinct modes of splash behaviour (rebound, pinned and fragmentation) which are dependent on the impact velocity of the droplet. In our studies, using high-speed videography, we show that such splash behaviour can be replicated on fixed 'model' water repellent soils (hydrophobic glass beads/particles). We show that the type of splash behaviour is dependent on both the size and chemical nature of the fixed particles. The particle shape also influences the splash behaviour as shown by drop impact experiments on fixed sand samples. We have also studied soil samples, as collected from the field, which shows that the type of droplet splash behaviour can lead to enhanced soil particle transport.