



## State-of-the-art of Grain-Size Analyses Using Laser Diffractometry

Bjoern Machalett (1,2)

(1) Humboldt-Universität zu Berlin, Institute of Geography, Climatology Group, Unter den Linden 6, 10099 Berlin, Germany  
(b.machalett@nakula.de), (2) Bentley University, Department of Natural and Applied Sciences, Waltham, Massachusetts, USA (bmachalett@bentley.edu)

Laser diffractometry is based on the principle that particles of a given size diffract light through a given angle: large particles scatter light at small angles, while small particles scatter light at big angles. The method has become accepted to measure grain-size distributions as it offers important advantages compared with traditional sieve-pipette methods or image particle analyses. Laser diffractometry allows fast measurements of large sample sets with high reproducibility and accuracy. Furthermore, this method needs only small amounts of sample material and offers a dynamic measuring range from around 0.04 to 2000  $\mu\text{m}$ . This paper summarizes improvements in lab procedures and methodology, as well as comprehensive experimental results using laser diffractometry leading towards a standardized protocol for applying laser particle size analysis in geomorphic and paleoenvironmental studies. It will be demonstrated that advances in measurement technologies as well as in sample collection and sample preparation reveal much more complex particle size distributions than it has been hitherto suspected.