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The variance of particle size distribution in experimental impact craters in sandstone.

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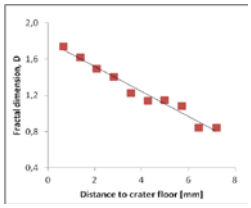
An experimental impact crater was investigated with regard to its particle size distribution (PSD). The experiment was conducted in the framework of the MEMIN research network with a 2.5 mm steel sphere impacting a dry sandstone at 4.8 km/s [1]. BSE micrographs were taken from thin sections beneath the crater floor. Automated image analysis software was used to determine the PSDs of the images. The equivalent diameter of the particles was plotted against the number of detected particles with a diameter >d in log-log diagrams. The slope of the resulting regression line is refered to as fractal dimension, D [2]. Interestingly the D values decrease with increasing distance to the crater floor (Fig. 1). This behavior indicates a dependency of PSD on strain or strain rate. This could be of interest for a deeper understanding of subsurface deformation in impact craters on a terrestrial or planetary scale.



[1] Kenkmann, T. et al. (2011) M&PS 46, 890–902. [2] Sammis, C.G. et al. (1987) P & A Geophys. 125, 777-812.

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