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MEMIN: Ejection behavior characteristics in experimental cratering

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The objective of this work is to understand the characteristics and the behavior of ejected material during experimental impacts into sandstone targets. For the first time, parameters like projectile mass, projectile velocity, and target pore space saturation with water were systematically changed and ejecta mechanics analyzed. The results of video analyses, the thorough examination of ejecta distribution on custom-designed catchers systems and a tracer paint analysis display a comprehensive sequence of the ejecta process: (i) a fireball containing molten material, (ii) a plume with comminuted quartz grains, (iii) a cone with increasing ejection angles and (iv) a tube of spall material. These stages are characterized by specific ejection angles, ejection velocities, particle size distributions, ejecta movement and shock metamorphic features. We have now developed a detailed picture of the effects caused by the individual impact parameters. On the basis of this and companion work, the development of a model including impact energy budget is currently being calculated.

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