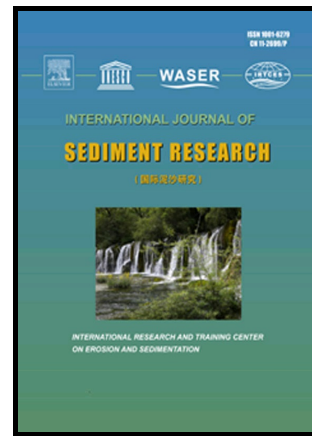


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Difference between static and dynamic angle of repose of uniform sediment grains

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ABSTRACT

In the investigation of sediment transport, it is necessary to differentiate various definitions of angle of repose (AoR) available in the literature. The static AoR, composed of upper and lower angle of slope, forms just before and after slope instability, while the dynamic AoR can be observed when sediment grains are moving continuously down an inclined plane. In the present study, a series of laboratory experiments was conducted to measure static and dynamic angle of repose for uniform natural sediments with median diameter of 0.28-4.38 mm. The results show that the different slope angles have different characteristics. The upper and dynamic AoR increase slightly with increasing grain diameter, while the lower AoR is not sensitive to changes in sediment size and may assume a constant value. The average of the upper and lower AoR is equivalent to the dynamic AoR, and the difference between them increases with increasing grain diameter. The present study suggests that the different angles of repose should be treated with caution when applying in investigations of bedload transport, dune migration and local scour development.

Keywords: Angle of repose, Avalanche, Sediment transport

1. Introduction

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