

## Survey on grain roughness in a mountain river by using airborne LiDAR point cloud data

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Small-scale topographic features are commonly found on a mountain river. One of the important features is grain roughness for affecting the water flow or debris flow resistance of the mountain channel. One of the difficulties is to measure grain roughness in a mountain river because a lot of grains and rocks are larger than a few meter diameter.

In this study, we use a point-cloud data earned by airborne LiDAR to calculate simple statistical indexes of the roughness in the lattice bins covered with the objective region of the mountain river. The results comparative with the in-situ grain size distribution earned by the grid count method show relatively good relationship.

Keywords: mountain river, grain roughness, airborne LiDAR