

Deformation of slope models with different orientations of weak planes

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Weak planes influence failure and deformation of slopes. We conducted experiments to simulate slopes of different orientations of weak planes, including cataclinal and analcinal slopes with 30° and 60° inclination angles of weak planes. We stacked artificial bricks to make small-sized slope models. The artificial bricks were made of gypsum, sand, cement and water with different weight proportion. In view of the scaling law, the artificial bricks were made less strength than natural rocks. The slope models were weakened under rainfall, resulting in deformation and final collapse. The slope deformation processes were photographed by a camera, and the displacement vector fields were analyzed using the Particle Image Velocimetry (PIV). The deformation and accumulated displacements were compared between slopes of different orientations of weak planes.

Keywords: cataclinal slope, analcinal slopes, rainfall, Particle Image Velocimetry (PIV), weak planes, deformation