A Study on Mechanism of the Limestone Debris Flow and its Flow Characteristics

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To prevent and mitigate disasters effectively, it is necessary to understand the triggering factors that initiate the occurrence of debris flow. To comprehend precisely this problem, a physical setup of a debris flow model was carried out at Ujigawa Open Laboratory. The physical model apparatus are composed of three main components: a flume open channel which is inclined on the solid bottom plane, a deposition area and water intake box. To understand the particle segregation and movement mechanism of the limestone grain (2.5 mm and 6 mm) flow, a high-speed video camera (HSVC) is used to capture a video footage during short intervals of 0-9s. Besides using HSVC, Kuraves software has been introduced to analyze debris flow characteristics. The measurement results are created as 3D data and it can be used for various purposes such as the length, area, volume, and cross-section of the object. In addition, a 3D CAD drawing can be captured in a 2D photograph taken with a commercially available digital camera. Figure 1(a) and 1(b) show the results of material deposition by Kuraves. Through this software more accurate and reliable estimation of debris flow characteristics and deposition patterns can be made. This paper presents and discusses about the routing of limestone grains at three different slope angles which are 15° (low), 20° (mild) and 25° (steep). A constant discharge was supplied within 7s for each slope angle cases.



Figure 1 (a) and 1(b) show the plan view and side view of the 15° case study.