國道 3 號七堵順向坡滑動過程之動態模擬

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摘　要　本文主要探討國道 3 號七堵順向坡滑動過程與最終堆積結果，利用三維分離元素軟體 (PFC3D)，針對平面型滑動之動態過程進行數值模擬。由數值模型分析結果顯示，當模擬元素間摩擦係數為 0.03 時，堆積地形與空拍及相關地形量測結果最為吻合，其最大滑移速度可達 23.6 公尺/每秒 (約 85 公里/小時)，並使整個崩塌體堆積至高速公路對面邊坡。另外，由模擬結果發現，於 2-4 秒時，滑動體平均速度達 10.2 公尺/每秒 (約 36.7 公里/小時)，其高速公路與 3 部小客車均已遭掩埋，而模擬至 7.5 秒後，整個塊體將停止運移，並於高速公路及兩側邊坡形成低破碎度之堆積體。

關鍵詞：平面型滑動、動態過程、數值模型。

A Kinematic Model of the Translational Slide at the Cidu Section of Formosan Freeway

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ABSTRACT　This paper presents the results of a case study on the translational slide at the Cidu section of Formosan freeway, including its kinematic process and the deposition geometry. Numerical modeling of the slides interaction was carried out using a 3D distinct element program, PFC3D (Itasca, 1999). When the friction coefficient of each particle was about 0.03, the predicted maximum velocity was about 23.6m/sec (about 85km/hr) and the debris reached the other side of Formosan freeway. Simulations showed the three cars and Formosan freeway were buried at 2-4sec (the predicted average velocity was about 10.2m/sec) and the translational slide stopped all motions to form the low fragmentation deposit at 7.5sec.

Key Words: translational slide, kinematic process, numerical modeling.

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