A Digital Image Analysis of Gravel Aggregate using CT Scanning Technique

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Abstract: Particle shape was one of the most important factors which affects the gravel aggregate’s properties. It was also one of the important factors that directly affects the performance of asphalt pavements. In this paper, the gravel aggregate of quartzite was studied by using the industrial CT instrument. MATLAB was used to capture the aggregate slice properties including reverse color, median filtering, noise reduction, binaryzation and so on. The 3D aggregate model was reconstructed by using the software of MIMICS. The three-dimensional model of the aggregate was further optimized. The best fitting cuboid, cylinder, cone and sphere information of the aggregate were obtained by using the characteristics analysis function.

Key words: CT scanning; 3D reconstruction; watershed transform; particle shape; gravel aggregate

1. Introduction

The morphological characteristics of coarse aggregate played a key role in the mechanical properties of asphalt mixture. It was therefore necessary to study the aggregate properties and its morphological characteristics through appropriate approaches. With the development of computer technology, computed tomography (CT) scanning technology had been widely used as an advanced non-destructive
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