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The Research and Implementation of Illumination Technology in the 3D GIS Visualization

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The Research and Implementation of Illumination Technology

in the 3D GIS Visualization

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1 Introduction

The realistic simulation of illumination effects is always a high-profile issues in the Three-dimensional visualization of geographic information system, is also the basic problem of computer graphics1. The illumination and dynamic display of the three-dimensional terrain model is not only providing with the technologies and measures of observing the terrain model vividly and dynamically on computer for people, but also making the terrain model which is clearly in pattern and rich of information reveal in front of us. So that our understanding of the study of region terrain pattern is more comprehensive rapid and detailed than ever before. In order to simulate the illumination phenomena in the real world better, it is need the illumination model to get the realistic lighting effects. A successful illumination model is more than a comprehensive expression of terrain and other factors in 3D landscape; it is with the features of information-rich, structured and strong sense of reality. It can clearly be seen that the successful of illumination model is signification to relevant professionals, and is also an integral part of three-dimensional geographic information system.

Currently, illumination model at home and abroad can be classified in different ways. Based on the difference of research materials it can be divided into fixed material illumination drawing and variable material illumination drawing; due to the diversities of study objects, it can be also divided into three-dimensional scene illumination drawing and terrain model illumination drawing; because of the differences of algorithm approaches, it can be divided into single-line method, multiple-line method, single-scattering method, multiple-scattering method etc.; and the most commonly used of classification which is classified according to the research techniques and modalities, that is the pixel-based illumination technology and the vertex-based illumination technology. However, the