

Development of volcano observation technology by cosmic ray muon radiography with nuclear emulsion

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Muon radiography is the non-destructive testing technique of large-scale constructions with cosmic ray muon. Cosmic ray muon has high penetrating power and it always comes from the whole sky. In the same way of taking a X-ray photograph, we can obtain integrated density of constructions. We had ever applied this technique to nuclear reactors, volcanos and so on, tested the principle.

At now, in order to more widely deployed this technology, we are developing it from both sides of the data-processing system and the detector. Our detector, nuclear emulsion (Fig), is high resolution three dimensional track detector. This detector has mrad angular resolution. In Nagoya University, we launched emulsion manufacturing equipment at 2010. It has become possible to flexible development of our detector. An important factor is the temperature characteristic to withstand the outdoor observation as a detector to be used in the muon radiography. In addition, the features which requires no power supply and can observe in a large area suitable for muon radiography. In this talk, I talk about basic characteristics (especially sensitivity and thermal properties) of nuclear emulsion and detector structure.

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