地球惑星科学・素粒子物理学・分野横断セミナー：

「カナリア諸島の火山活動と宇宙線による密度構造イメージング技術の適用」

- 講師：

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- 日時　2013 年 6 月 26 日（水）　13:30～
- 場所　理学部 D 館 2 階 211 号室（F 研サロン）

- プログラム

13:30-13:40
挨拶・講師紹介　宮本成悟（東大地震研）

13:40-14:40
Pedro Hernandez (INVOLCAN,ITER)
"Application of emulsion imaging system for cosmic-ray muon radiography to explore the internal structure of summit of Teide volcano and San Juan fault in Cumbre Vieja, Canary Islands, Spain"

14:40-15:10　coffee break

15:10-15:30
鷺谷　威
「カナリア諸島における GPS 観測とエル・イエロ島の火山活動に伴う地殻変動　」

15:30-15:50
宮本　成悟
「原子核乾板を用いた素粒子検出技術とミューオンラジオグラフィへの応用について」

※終了後，希望者は物理学科 F 研の原子核乾板飛跡読み取り装置を見学できます.

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TITLE:

"Application of emulsion imaging system for cosmic-ray muon radiography to explore the internal structure of summit of Teide volcano and San Juan fault in Cumbre Vieja, Canary Islands, Spain"

by Pedro A. Hernandez (INVOLCAN,ITER)

ABSTRACT:

The internal structure of volcanoes, especially in their upper part, is product of past eruptions. Therefore, the knowledge of the internal structure of a volcano is of great importance for understanding its behaviour and to forecast the nature and style of the next eruptions. For these reasons, during past years scientists have made a big effort to investigate the internal structure of the volcanoes with different geophysical techniques, including deep drilling, passive and active seismic tomography, geoelectrics and magnetotellurics and gravimetry. One of the limits of conventional geophysical methods is the spatial resolution, which typically ranges between some tens of meters up to 1 km. In this sense, the radiography of active volcanoes based on natural muons, even if limited to the external part of the volcano, represents an important tool for investigating the internal structure of a volcano at higher spatial resolution (Macedonio and Martini, 2009). Moreover, muon radiography is able to resolve density contrasts of the order of 1–3%, significantly greater than the resolution obtained with conventional methods. As example, the experiment of muon radiography carried out at Mt. Asama volcano by Tanaka et al., 2007, allowed the reconstruction of the density map of the cone and detection of a dense region that corresponds to the position and shape of a lava deposit created during the last eruption in 2004. In the framework of a research project financed by the Canary Agency of Research, Innovation and Information Society, we implemented during 2012-2013 muon measurements at Teide volcano in Tenerife Island and it is planned to perform muon measurements from October 2013 at San Juan fault in Cumbre Vieja volcano, La Palma Island, to radiographically image the subsurface structure of these two volcanic edifices. The data analysis will involve the study both of the shallow structure of both volcanoes and of the requirements for the implementation of the muon detectors. Cumbre Vieja and Teide are two active volcanoes that arouse great interest in the scientific community and society due to their volcanic features and specific hazards associated with volcanic activity.