

Research Report

ICRR Inter-University Research Program 2021

Research Subject:

Study for Galactic CR origin using the ALPACA air shower array in Bolivia

Principal Investigator:

Pedro Miranda

Participating Researchers:

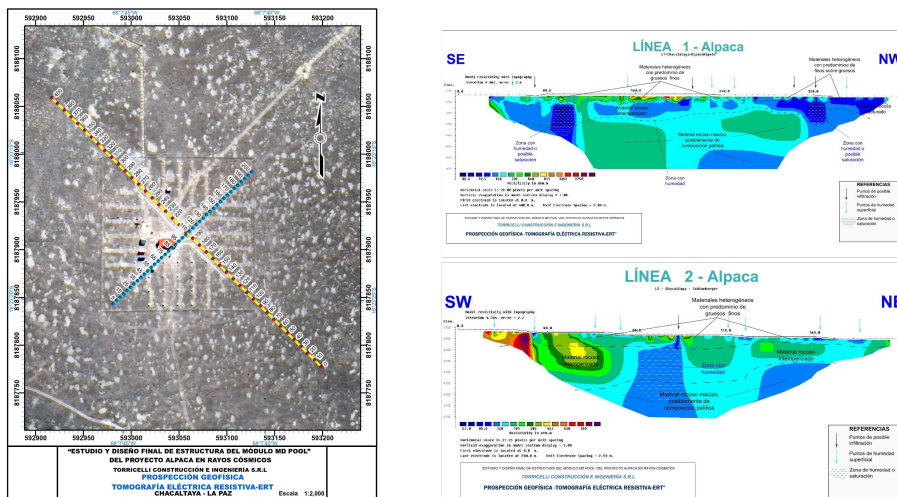
Pedro MIRANDA, Rolando TICONA, Hugo RIVERA, Martin SUBIETA, Mirko RALJEVICH (Universidad Mayor de San Andres)

Yoshiki Tsunesada (Osaka City University)

Masato Takita, Takashi Sako, Munehiro Onishi, Kazumasa Kawata, Takashi Sako, Sei Kato (ICRR, University of Tokyo)

Summary of Research Result :

Due to the COVID-19, Japanese members could not visit the site and the construction of the array delayed. Nevertheless, activities in Bolivia such as infrastructure works and preparation for the muon detector (MD) construction have progressed. According to a geophysical survey, underground condition at the candidate MD locations were studied. As shown in the figure (left), the survey was performed along the cross lines centered at the ALPACA array. The right figures show the underground resistivity, corresponding to the hardness of soil, which revealed there is neither hard rock nor muddy soil at the locations of MDs.



The structure of the muon detector was designed by a Bolivian construction company and optimization of the design is intensively discussed by biweekly online meetings by ICRR and UMSA members. New PMTs were purchased to test dynamic range to be used for the wide range PMTs. Test is ongoing at ICRR and some preliminary results were presented at JPS meeting.

Expected performance of the ALPAQUITA array was summarized and published in the Experimental Astronomy journal. (Exp.Astron. (2021) 52:85-107)

No.