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FULL ABSTRACT BOOK



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Geoelectric survey to study the ground state beneath facilities of the Peruvian Antarctic Station Machu Picchu

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A geoelectrical survey using electrical resistivity tomographies was carried out in January 2019 under the facilities of the Peruvian Antarctic Station Machu Picchu. The station is located in the Admiralty Bay of King George Island of the South Shetland Islands archipelago. The main objective of the survey was estimating the depth and the lateral extent of the frozen ground found beneath the main building of the Machu Picchu station during maintenance work performed in the antarctic summer of 2018.

Two rectangular shaped buildings of the Machu Picchu Antarctic Station were chosen to measure the ground electrical resistivity beneath them. In the biggest building the electrical profiles crossed 14 m beneath it along its smallest dimension; in the other (a refuge) the electrical profile crossed 7 m beneath the building, also along its smallest dimension. To carry out the geoelectrical profiles 40 active electrodes were used in a Wenner configuration; 1 m and 2 m distance between adjacent electrodes were used for different profiles.

Preliminary interpretation of the electrical resistivity data indicates that in both buildings there is a small layer of frozen ground which has also been detected by thermometers installed in 2018, as well as by eye inspection after digging a small hole to install new thermometers. However, beneath the frozen ground layer, coinciding with the area of both buildings, a low electrical resistivity layer, about 1 to 2 m thick, with electrical resistivity values as low as 20 Ω .m, was found.