GEOELECTRIC SURVEY BY MULTIELECTRODE ARRAY TO INVESTIGATE MARBLE RUINS ON THE SOUTH BRICK WALL OF THE NORTH AISLE OF MASSENZIO'S BASILICA (ROMAN FORUM, ROME)

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During the restoration of Massenzio's Basilica arise the need to determine the thickness of marble ruins of an angle capital that were inside the south brick wall at a height of 12m from soil. This was because the archaeologist need to know the stability of the ruins to plan the restoration. Taking advantage the dipping discontinuity surface between the marble and the bricks we face such problem performing a geoelectric survey by a multielectrode dipole-dipole array. We performed two lines, a vertical and a horizontal ones on the boundary of the ruins, on the brick wall, with an interdistance between the electrodes respectively of 35cm and 40cm. At first we used as electrodes copper plates plated in silver with a diameter of 2cm but the contact resistance was too high, about 10kΩ. We repeated the experiment changing the electrodes we used lath nails 10 cm long, in this case the contact resistance decreased to less of 1kΩ. At first the resistivity values increased because of the marble, when the distance between the electrodes increased the influence of the marble vanished and the resistivity values decreased to the values of brick wall. This was flag to determine the depth of the marble inside the brick wall. To process data we used the inversion algorithm proposed from deGroot-Hedlin e Constable 1990 and Sasaki 1992 with damping factor. We detected depth at about 0.90m with an uncertainty of 10%. The restores matched such result measuring the cavity of the symmetric destroyed angle capital in the other side of the brick wall such measurements give as depth 0.85m.