The National Geographic Institute of Argentina (IGN) is making its final altimetric network compensation. For it is completing, the IGN is measuring the lasts geometric slopes, together with gravity and differential GPS measurements in the area of the Puna Argentina.

The particularity of this area is the great height that has the topographic surface (from 3000 meters above the sea level), and the greats slopes in short distances. This area is considered the "Roof of America".

Performed measurements allowed calculating the orthometric and normal heights of 150 benchmarks that composed a closed leveling circuit of about 500 kilometers, with altitudes that oscillate between 2000 to 4000 meters. These measurements also permitted calculating the position of the Geoid in the area due to GPS observations over the benchmarks.

In this work it is shown the applied measuring methods and calculations to obtain the orthometric and normal heights. It is also exposed the differences between geometric, orthometric and normal heights. Finally, a comparison was made between the geoidal heights of the benchmarks obtained from the measurements in the area and the obtained from the EGM08 model.