

# THREE-DIMENSIONAL RECONSTRUCTIONS FROM AERIAL PHOTOGRAPHS OF THE MEGALITHIC TUMULUS OF LA COBERTORIA, NEAR CAMPA SAN JUAN (ASTURIAS, SPAIN)



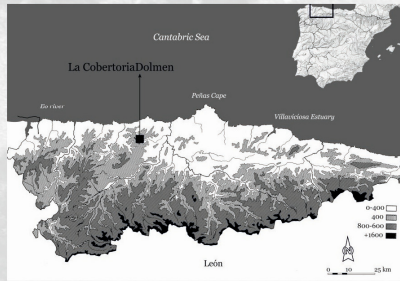
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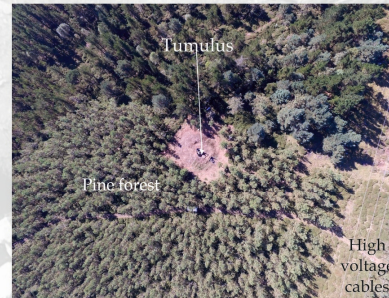
## 1) PROJECT: LA COBERTORIA DOLMEN (NW OF IBERIA)

Excavations in the megalithic tomb of La Cobertoria, Salas (Asturias, Spain) started in 2016, funded by the Valdés-Salas Foundation as part of a Project focused on studying the Neolithic in this area. La Cobertoria is a very remarkable example of the megalithism in Asturias, especially during the last part of this phenomenon (first part of the IV millennium, approximately). The burial chamber is not the biggest in the Iberian Peninsula but is one of the most spacious between the Asturian group. For example, its area it is very close to the famous tomb of Santa Cruz (Cangas de Onís).



## 2) AERIAL PHOTOGRAPHS: THE IMAGE ACQUISITION PROCESS

The photographs were taken in different heights over the prehistoric structure, using as well several angles: oblique mainly, for the 3D, and vertical. The drone (DJI Phantom III Advance) took 171 pictures of the tumulus.



In this area there were three important constraints affecting the image acquisition:

- The megalithic tomb is situated in the middle of a forest.
- There is high-voltage cables in the vicinity.
- The tumulus is located at 750 meters above the sea level and, for this reason, the near area has strong winds (at the top part of the mountain).

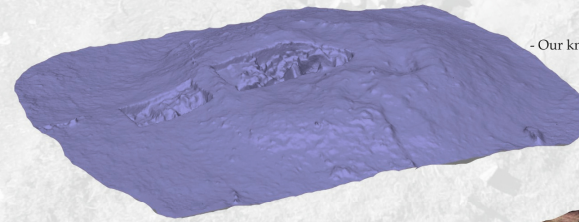
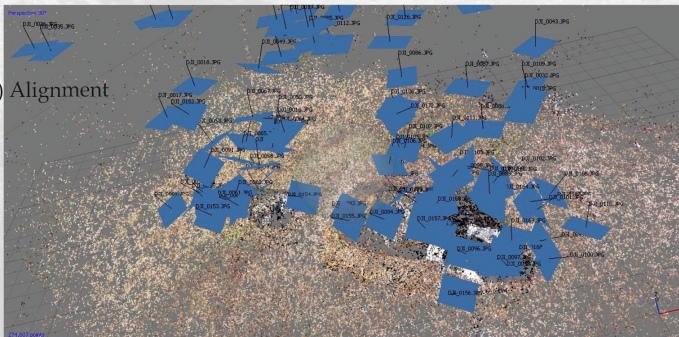
## 3) THREE-DIMENSIONAL RECONSTRUCTION STEPS

ADVANTAGES of the aerial photographs in la Cobertoria:

-To gather crucial volumetric information about the structure, providing different points of view (sections, heights, etc) of the tumulus, essential for explaining its phases.

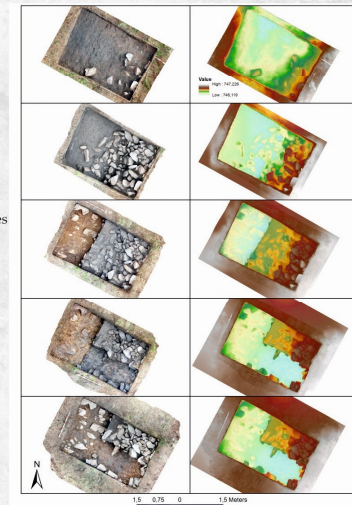
- Our knowledge about the tomb could be shared by the net, thanks to the web files (video, gifs, etc). this information may also be suitable for all audiences.
  - The orthophoto will offer in the near future different possibilities to link the prehistoric structure with their surroundings.
  - Allow us to have a virtual resources that provides information about the excavation or the archaeological site.
- The data are gathered very quick and fast access to all the information are available after processing the images.

3.1) Alignment

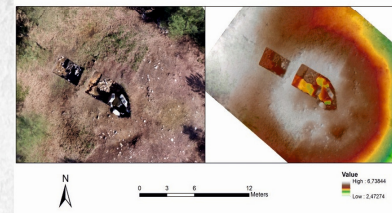


DISADVANTAGES of the aerial photographs in la Cobertoria:

- The location inside a forest, near high voltage cables and with strong winds. The place has too special difficulties to achieve a correct lighting.

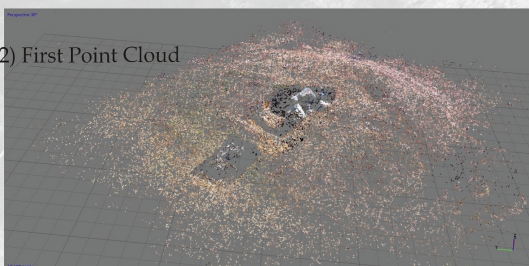


Collecting the data (right):  
 Digging progress through the  
 orthographic photogrammetry (left)  
 and DSMs (right).



0 0.75 1.5 3.0 Meters

3.2) First Point Cloud



3.3) Dense Cloud

