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Horizon synthesis for archaeo-astronomical purposes

Ferdinando Patat

(Submitted on 11 Jul 2011)

In this paper I describe a simple numerical procedure to compute synthetic horizon altitude profiles for any given site. The method makes use of a simplified model of local Earth's curvature, and it is based on the availability of digital elevation models describing the topography of the area surrounding the site under study. Examples constructed using the Shuttle Radar Topographic Mission (SRTM) data (with 90m horizontal resolution) are illustrated, and compared to direct theodolite measurements. The proposed method appears to be reliable and applicable in all cases when the distance to the local horizon is larger than ~10 km, yielding a rms accuracy of ~0.1 degrees (both in azimuth and elevation). Higher accuracies can be achieved with higher resolution digital elevation models, like those produced by many modern national geodetic surveys.

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