

The Earthshine Network: an update 1998-2013

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Abstract

The amount of energy coming into the Earth's climate system is the combination of two parameters: solar constant, and Earth's albedo (or reflectance). Our main goal in this work is to record an absolutely-calibrated global albedo time series. The albedo can be determined by alternative observations of the bright and dark sides of the Moon. The bright side tells us the amount of sunlight received in the Earth and the Moon. On the other hand, the dark side of the Moon – called “earthshine” or “ashen light” – provides information about the global reflectance of the Earth.

This is a long-term astronomical study with an interdisciplinary approach, that contributes to increase our knowledge about climate and cloud coverage at planetary scale. To this end we are building a global network, with telescopes in different locations around the world, in order to increase the precision of our data. More telescopes means better time and spatial coverage of the Earth. At this moment we have three stations in EEUU, Spain, and Ukraine. In this work, we present the albedo's temporal variability in the data that we have taken along the past fifteen years (1998–2013).