Supplementary Material to:

Spatio-temporal characterization of long-term solar resource using spatial functional data analysis: Understanding the variability and complementarity of global horizontal irradiance in Ecuador

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Table S1. Overview of studies on the analysis of spatio-temporal variability of the solar resource at a regional scale using gridded satellite datasets (GHI: Global horizontal irradiance, DNI: Direct normal irradiance, NA: not available)

Author, Publication year	Objective	Region	Dataset	Time period	Temporal resolution	Spatial resolution	Number of grid points	Classification method
Habte et al., 2020 [1]	To assess the long-term spatial and temporal solar resource variability at a regional scale	America (land surfaces only)	gridded satellite data (GHI, DNI)	20 years	30 min, then aggregated to seasonal, annual and long-term averages	4 x 4 km	2 million (approx.)	Köppen-Geiger climate classification
Gutierrez et al., 2017 [2]	To analyze the variability and complementarity of the solar resource and photovoltaic production among sub-regions of a wide area	Iberian Peninsula	gridded satellite data (GHI)	30 years	daily	0.05 x 0.05 degrees	NA	k-means initialized with a complete linkage hierarchical clustering solution of a dimension-reduced dataset by principal component analysis
Laguarda et al., 2020 [3]	To understand the impact of El Niño South Oscillation on the solar resource over a region of southeastern South America	southeastern South America (containing Uruguay)	gridded satellite data (GHI)	15 years	hourly, then aggregated to long-term monthly averages	1 x 1 degrees	31	k-means initialized with a Ward hierarchical clustering solution after reducing the dimensionality of the dataset by principal component analysis
Vindel et al., 2020 [4]	To analyze the spatial and temporal variability of solar irradiance over a region affected by the intertropical convergence zone	Zambia and surrounding zones	gridded satellite data (GHI)	9 years	daily	0.1 x 0.1 degrees	14,500	Principal component analysis to obtain temporal variability patterns and k-means based on the interquartile range to analyze the spatial variability

Table S1. *Cont.*

Author, Publication year	Objective	Region	Dataset	Time period	Temporal resolution	Spatial resolution	Number of grid points	Classification method
Zagouras et al., 2013 [5]	To determine the location of measuring sites for solar irradiance	Greece	gridded satellite data (Cloud modification factor)	2 years	daily	0.05 x 0.05 degrees	28,800	k-means after reducing the dimensionality of the dataset by principal component analysis
Zagouras et al., 2014 [6]	To determine coherent zones of global horizontal irradiance for a utility-scale territory	California	gridded satellite data (GHI)	2 years	30 min	0.01 x 0.01 degrees	NA	k-means initialized with a deterministic scheme after reducing the dimensionality of the dataset by principal component analysis
Zagouras et al., 2014 [7]	To select candidate locations for solar power plants that take into account solar variability and geographical smoothing effect	Lanai Island (Hawaii)	gridded satellite data (GHI)	15 years	30 min	0.01 x 0.01 degrees	411	k-means initialized by Affinity propagation method applied to a dimensionally reduced dataset through principal component analysis

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