

YY Solar Resource Variability

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Abstract

In this chapter, we describe a methodology to quantify the variability of the solar resource. We describe how the considered temporal scales, from seconds to hours, and geographical scales, from a single point to a subcontinent, are interrelated and lead to a quantifiable smoothing effect. We discuss the implications of the temporal/spatial nature of the solar resource variability on the solutions needed to absorb a growing proportion of solar-generated energy on power grids.

Introduction

The term *variability* is a general term that applies to many aspects of solar radiation. For example, variability is used to refer to the change in resource from one year or one season to the next as well as the variability of the solar resource from one site to another (Gueymard & Wilcox, 2011, Vignola, 2001)

In this chapter, we focus on the short-term temporal variability of the solar resource caused by weather and passing clouds corresponding to time scales of seconds to tens of minutes. This type of variability is illustrated in fig. yy1.