

Mapping of Solar Radiation Anomalies Based on Climate Change

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Abstract : The use of alternative energy sources to meet energy demand reduces environmental damage. To diversify an energy matrix and to minimize global warming, a solar energy is gaining space, being an important source of renewable energy, and its potential depends on the climatic conditions of the region. Brazil presents a great solar potential for a generation of electric energy, so the knowledge of solar radiation and its characteristics are fundamental for the study of energy use. Due to the above reasons, this article aims to verify the climatic variability corresponding to the variations in solar radiation anomalies, in the face of climate change scenarios. The data used in this research are part of the Intercomparison of Interconnected Models, Phase 5 (CMIP5), which contributed to the preparation of the fifth IPCC-AR5 report. The solar radiation data were extracted from The Australian Community Climate and Earth System Simulator (ACCESS) model using the RCP 4.5 and RCP 8.5 scenarios that represent an intermediate structure and a pessimistic framework, the latter being the most worrisome in all cases. In order to allow the use of solar radiation as a source of energy in a given location and/or region, it is important, first, to determine its availability, thus justifying the importance of the study. The results pointed out, for the 75-year period (2026-2100), based on a pessimistic scenario, indicate a drop in solar radiation of the approximately 12% in the eastern region of Rio Grande do Sul. Factors that influence the pessimistic prospects of this scenario should be better observed by the responsible authorities, since they can affect the possibility to produce electricity from solar radiation.

Keywords : climate change, energy, IPCC, solar radiation

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