

Title

(subtitle)

by

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School of Mathematics and Statistics

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Abstract

Fundings

This work was supported by the University College Dublin Structured Ph.D programme in Applied and Computational Mathematics, and was funded by the Science Foundation Ireland (SFI).

Statement of Original Authorship

"I hereby certify that the submitted work is my own work, was completed while registered as a candidate for the degree stated on the Title Page, and I have not obtained a degree elsewhere on the basis of the research presented in this submitted work"

Collaborations

My mentor during the research master's was:

Dr. XXX

Acknowledgements

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And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Dedication

To my family and friends, without whom I would not be here.

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Chapter 1

Introduction

The fraction of irradiation reflected by Earth's surface is called the albedo. It is linked with the composition and properties of the surface and, therefore varies throughout the year. The average albedo for our planet Earth is between 0.1 and 0.3. Using "ERA5-Land monthly averaged data from 1950 to present" from the Copernicus Datastore [H. Hersbach, B. Bell, P. Berrisford, S. Hirahara, A. Horányi, J. Muñoz-Sabater, J. Nicolas, C. Peubey, R. Radu, D. Schepers, et al. \[2020\]](#), it is possible to retrieve the variable "forecast albedo", which is defined as *the fraction of solar (shortwave) radiation reflected by Earth's surface, across the solar spectrum, for both direct and diffuse radiation*. The figure 1.1 represent monthly averaged albedo value from 1993 to 2022.

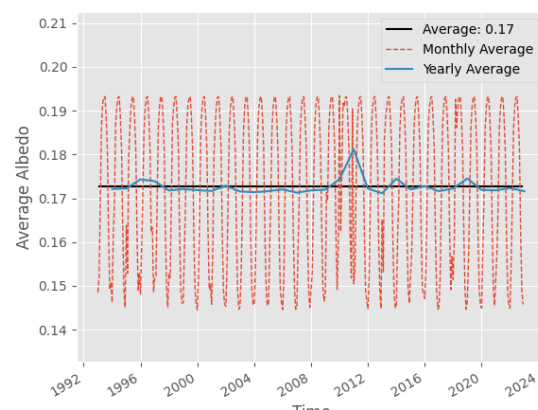


Figure 1.1: Average value over Ireland from 1993 to 2022

The meaning of this graphic above, is to show the variation of the albedo over the last 30 years in Ireland around a average value of 0.17. Under normal circumstance, the albedo hits a maximum during winter and falls back to a minimum during summer. During winter, snow appears which increases the amount of reflected radiation. The last week of 2010, famously covered the majority of the land in snow, which result in a anomalously high value of the albedo as explained by [N. D. Walther C.A. Cámara García, J. Gault \[2021\]](#).

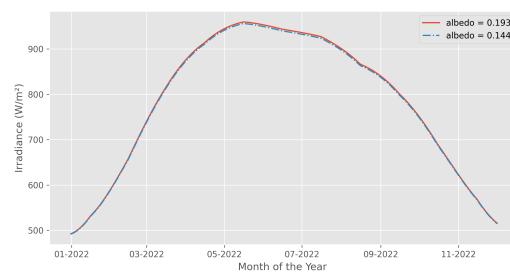


Figure 1.2: Difference of the global irradiance on a module plane for two extremes albedos at 12:00

Chapter 2

State of the Art

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Chapter 3

Analysis Framework

Chapter 4

Experimental Details and Results

Chapter 5

Conclusions and Future Work

Appendices

Appendix A

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