Acknowledgments

It is my pleasure to acknowledge the people, who have helped me reach the completion of my Ph.D. research.

First of all, my sincere and deepest gratitude is to my thesis supervisor and Associate Professor, *Dr. B. Ravindra*, Mechanical Engineering Department, for providing me an opportunity to pursue Ph.D. under his guidance at Indian Institute of Technology Jodhpur. He has provided me regular advice about selecting best results from vast previous research in solar radiation and resource assessment area and guided me in an efficient way. I truly enjoyed working with him and learned various life lessons. His unique problem-solving approach and clear creative thinking motivate me a lot.

I would also like to extend my regards and thanks to *Dr. Laltu Chandra*, *Dr. V. Narayanan* and *Dr. Vivek Vijay* for providing me valuable feedback on my research work.

I am also thankful to *Vikas Pratap Singh* and *Dr. Belal Usmani* for being always available for discussion on solar energy fundaments and their applications.

This work would not materialize without the solar radiation database provided by *IMD-Jodhpur* and *SRRA-Jodhpur*. Some visits to *IMD-Pune* and *NISE-Gurgaon* also helped in understanding research fundamentals and current implementation of my research area.

I am also thankful to my colleagues and other lab members who have motivated me throughout my research work, at various levels.

Finally most important I pay my sincere gratitude to my family (Mr. Dharam Pal, Mrs. Sumitra Pal, Mr. Sumit Kumar, Mrs. Jaishree Rathore, Mrs. Richa Gurawa, Mr. Sujai and Ms. Dhara), for being with me all the time and, silently supporting every step of mine, ignoring all my ignorance and mistakes. I was able to come so far because of their prayers, blessing and support.

Dharmesh Kumar
Ph.D. Student

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List of Symbols

Symbol	*Description*
A, B, C	Angstrom Constant
A_1, B_1 C_1, D_1	Local Coefficients used in Cloud Radiation Modelling
DBR	Diffuse Beam Ratio
DBT	Dry Bulb Temperature
ETR	Extra- terrestrial Radiation
$\hat{G}(x_o)$	Sum of all Station in Spatial Consistency Test
$G(x_o)$	Individual Station Value in Spatial Consistency Test
H_d	Hourly Diffused Radiation Value
H_g	Hourly Global Radiation Value
$I_{absorbed}$	Absorbed Radiation, by Atmosphere
$I_{reflected}$	Reflected Irradiance, back to Space
I_B	Beam or Direct Horizontal Irradiation
$I_{B,C}$	Beam or Direct Horizontal Irradiation at Clear Sky
I_{BN}	Beam Radiation at Direction of the Rays
I_D	Diffused Horizontal Irradiation
$I_{D,C}$	Diffused Horizontal Irradiation at Clear Sky
$I_{D,OC}$	Diffused Horizontal Irradiation at Overcrowded Sky
I_E	Extraterrestrial Radiation
I_G	Horizontal Irradiation
$I_{G,C}$	Horizontal Irradiation at Clear Sky
K_d	Earth-Sun Correction Factor
N	No. of Stations
O	No. of Stations Cloud presence (Scale 1-8 Oktas)
P_{atm}	Atmospheric Pressure
Prs	Station Surface Pressure in milli-Bars
R	Maximum Distance Between Stations
R^2	Coefficient of Determination
R_L	Rayleigh Diffuse Limit
SD, SD_{max}	Sunshine Duration, Max Sunshine Duration
SF= n/N	Ratio of Measured Sunshine and Averaged Sunshine (Sunshine Factor)
T_{LK}	Linke Turbidity
T_{rd}	Theoretical Diffuse Irradiance
WBT	Wet Bulb Temperature
a,b	Constants used in Theoretical Radiation Calculation
(a_1---a_n), (b_1---b_n), (c_1----c_n)	Constants used in Quartile Analysis
d,e,f,g,h,i	Constants used in Rayleigh Calculation
j,l, d_1	Constants for [Skartveit et al., 1987]
a1,b1,c1	Coefficients used in Gap Filling with 95% Confidence Bounds
d_z	Station in between distance (x_o with other stations)
Exp	Exponential
H	Solar Elevation Angle
k_t	Clearness Index
k_t'	Alternate Sky Clearness Index
k_n	Direct Beam Index
k, k_o, k_1	Diffuse Horizontal Transmittance
M	Air Mass
N	No. of Days

p1,p2,p3…,p9	Coefficients used in Gap Filling with 95% Confidence Bounds
r_s	Ground Albedo
r_α	Cloudless Sky Albedo
w_z	Interpolation Coefficient
$\bar{x}$	Mean
x_i	Measurement Value
$\bar{x}_i$	Gap Filling Model Output
x_o	Station Location
x_z	Next Station Location
z	Solar Zenith Angle
α	Solar Altitude
β	Location Constant for [Skartveit et al., 1987]
δ	Declination Angle
δ_r	Rayleigh's Optical Depth
ε	Earths Eccentricity Factor
Φ	Latitude Angle
σ_n	Standard Deviation
τ	Atmospheric Transmittance
τ_α	Mie Scattering
τ_g	Transmittance Ratio for Mixed Gases Scattering
τ_o	Transmittance Ratio for Ozone
τ_r	Rayleigh Scattering
τ_w	Transmittance Ratio for Water Vapour Scattering
ω	Solar Hour Angle

List of Abbreviations

Abbreviation	*Full form*
ACR	Absolute Cavity Radiometers
ASES	American Solar Energy Society
ASCII	American Standard code for Information Interexchange
ASHRAE	American society of Heating, Refigrtaion and Air-conditioning Engineers
BSRN	Baseline Surface Radiation Network
CCS	Carbon Capture and Storage
CEA	Central Electricity Authority
CSP	Concentrated Solar Power
C-WET	Centre for Wind Energy Technology
CIE	Commission Internationale de l'Eclairage
DHI	Diffuse Horizontal Irradiance
DNI	Direct Normal Irradiance
ESRA	European Solar Radiation Atlas
FORTRAN	Formula Translating Algorithimic Language
GWh	Giga- Watthour
GMS	Geostationary Metrological Satellite
GHG	Green House Gases
GHI	Global Horizontal Irradiance
GTI	Global Tilted Irradiance
GHI_{clear}	Global Horizontal Irradiance at Clear Sky
GIZ	Gesellschaft für Internattionale Zusammenarbeit
ISHRAE	Indian Society of Heating Refrigeration and Air-Conditioning Engineers
IRENA	International Renewable Energy Agency
IMD	Indian Meteorological Department
ISO	Intenational Organization for Standardization
LAT	Latitude
MATLAB	Matrix Laboratory
MRM	Metrological Radiation Model
MBE	Mean Bias Error
MNRE	Ministry of New and Renewable Energy
NREL	National Renewable Energy Laboratory
NASA	National Aeronautics and Space Administration
OTEC	Ocean Thermal Energy Conversion
PV	Photo-Voltaic
PTI	Press Trust of India
RH	Relative Humidity
RMSE	Root Mean Square Error
RDNI	Reflected DNI or albedo measurement
RMSE	Root Mean Square Error
SPSS	Statistical Package for the Social Sciences
TSI	Total Sky Imager
WRR	World Radiometric Reference Scale
WMO	World Metrological Organization
W/m^2	Watt per square meter