SWC 2023

INSTRUCTIONS FOR EXTENDED ABSTRACTS

TITLE

Summary

Include a short summary of your abstract here. The summary should not exceed 10 lines, and should include key-words.

Keywords: Type your keywords here, separated by commas

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1. Blind Review (SWC_Heading1)

To ensure an objective rating of your scientific work, the SWC 2023 conference will use a “blind” (i.e., anonymous) review process. This means that the reviewers will not be able to see who has submitted the abstract. Therefore, the abstract submission will consist of two separate parts:

- Completion of the web-based form on the SWC 2023 website including title, authors, affiliation, address, email, and preferred conference topics.
- Upload of the extended abstract describing your results in more detail (up to 3 pages) as an unprotected pdf-file to the SWC 2023 Conference website. Do not give any details (such as author names or affiliation) in your extended abstract that would reveal your identity! The reviewers will only receive this extended abstract for rating your submission.

2. Introduction

This is both a guideline and a template for preparing your manuscript. To format your manuscript correctly, please use the fonts and type sizes defined in this document. The manuscript must be uploaded as .pdf file to the SWC 2023 website. The length of the abstract must not exceed 3 (three) pages.

3. Abstract formatting

The manuscript must be written in English. The abstract title should be written in CAPITAL letters, Arial, 14 pt bold. The section headings should be numbered, in Arial 10 pt bold (SWC_Heading 1), the sub-sections in Arial 10 pt italic. The standard font for the manuscript is Times New Roman for the text and Symbol for special characters. Body text should be justified as block (SWC_Text), 10 pt, in single column format.

The paper size is A4 (210 mm x 297 mm). Margins are 30.0 mm top and left; 25.4 mm right and bottom. Do not insert a page number! References should be given exactly as shown in the example given below.

Number the sections and sub-sections, and do not use automatic paragraph numbering.

4. Tables, figures, equations, and lists

4.1. Tables (SWC_Heading1.1)

All figures and tables should be cited in the text, numbered in order of appearance and followed by a centered title. All table columns should have a brief explanatory heading.

Tab. 1: Table captions (8 pt) should be justified as block and placed above the table (SWC_TableFigureCaption)

Table Header	SWC_TableHeader	Header
Tables	SWC_TableText	Text

4.2. Figures

Figures should be with a resolution of minimum 300 dots per inch and followed by a figure caption, justified as block.

Fig. 1: Figure captions (8 pt) should be justified as block and placed below the figure (SWC_TableFigureCaption)

4.3 Equations

Equations should be arranged to the left, with characters similar to that of the body text and should be numbered.

$$\frac{1}{2\pi}\int_0^{2\pi}\frac{d\theta}{a+b\sin\theta}=\frac{1}{\sqrt{a^2-b^2}}$$ (eq. 1)

$$\sin\alpha\pm\sin\beta=2\sin\frac{1}{2}(\alpha\pm\beta)\cos\frac{1}{2}(\alpha\mp\beta)$$ (eq. 2)

4.4 Lists

- Bulleted lists can be used to arrange information more clearly in the text.

5. References

All references should be made according to the “Solar Energy Journal” guidelines, as shown below.

Please ensure that each reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be indicated completely. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text.

For web references, at least the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Text:

All citations in the text should refer to:

1. *Single author:* the author's name (without initials, unless there is ambiguity) and the year of publication;
2. *Two authors:* both authors' names and the year of publication;
3. *Three or more authors:* first author's name followed by "et al." and the year of publication.

Citations may be made directly (or parenthetically). Groups of references should be listed first alphabetically, then chronologically.

Example: "as demonstrated (Allan, 1996a, 1996b, 1999; Allan and Jones, 1995). Kramer et al. (2000) have recently shown ...."

List:

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication.

Examples for references:

Reference to a journal publication:
Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2000. The art of writing a scientific article. Journal of Scientific Communication. 163, 51-59.

Reference to a book:
Strunk Jr., W., White, E.B., 1979. The Elements of Style, third ed. Macmillan, New York.

Reference to a chapter in an edited book:
Mettam, G.R., Adams, L.B., 1999. How to prepare an electronic version of your article, in: Jones, B.S., Smith, R.Z. (Eds.), Introduction to the Electronic Age. E-Publishing Inc., New York, pp. 281-304.

Use of units and symbols:

For the use of units and symbols in Solar Energy, please see the appendix below.

Appendix: UNITS AND SYMBOLS IN SOLAR ENERGY

In 1977, a committee of ISES developed a set of recommended nomenclature for papers appearing in *Solar Energy*. This is a condensed and revised version of those recommendations. The original appeared in *Solar Energy* **21**.61-68 (1978).

1. UNITS

The use of S.I. (Système International d'unités) in *Solar Energy* papers is mandatory. The following is a discussion of the various S.I. units relevant to solar energy applications.

Energy

The S.I. unit is the joule ($J \equiv kg\ m^2\ s^{-2}$). The calorie and derivatives, such as the langley ($cal\ cm^{-2}$), are not acceptable. No distinction is made between different forms of energy in the S.I. system so that mechanical, electrical and heat energy are all measured in joules. Because the watt-hour is used in many countries for commercial metering of electrical energy, its use is tolerated here as well.

Power

The S.I. unit is the watt ($W \equiv kg\ m^2\ s^{-3} \equiv J\ s^{-1}$). The watt will be used to measure power or energy rate for all forms of energy and should be used wherever instantaneous values of energy flow rate are involved. Thus, energy flux density will be expressed as $W\ m^{-2}$ and heat transfer coefficient as $W\ m^{-2}\ K^{-1}$. Energy rate should not be expressed as $J\ h^{-1}$.

When power is integrated for a time period, the result is energy that should be expressed in joules, e.g. an energy rate of 1.2 kW would produce 1.2 kW x 3600 s = 4.3 MJ if maintained for 1 h. It is preferable to say that

Hourly energy = 4.3 MJ

rather than

Energy=4.3 MJ h^{-1}.

Force

The S.I. unit is the Newton ($N \equiv kg\ m\ s^{-2}$). The kilogram weight is not acceptable.

Pressure

The S.I. unit is the Pascal ($Pa \equiv N\ m^{-2} \equiv k^2\ m^{-1}\ s^{-2}$). The unit $kg\ cm^{-2}$ should not be used. It is sometimes practical to use 10^5 Pa = 1 bar = 0.1 MPa. The atmosphere (1 atm = 101.325 kPa) and the bar, if used, should be in parenthesis, after the unit has been first expressed in Pascals. e.g. 1.23 x 10^6 Pa (12.3 atm). Manometric pressures in meters or millimeters are acceptable if one is reporting raw experimental results. Otherwise they should be convened to Pa.

Velocity

Velocity is measured in $m\ s^{-1}$. Popular units such as $km\ h^{-1}$ may be in parentheses afterward.

Volume

Volumes are measured in m^3 or litres (1 litre = 10^{-3} m^3). Abbreviations should not be used for the litre.

Flow

In S.I. units, flow should be expressed in $kg\ s^{-1}$, $m^3\ s^{-1}$, litre s^{-1}. If non-standard units such as litre min^{-1} or $kg\ h^{-1}$ must be used, they should be in parentheses afterward.

Temperature

The S.I. unit is the degree Kelvin (K). However, it is also permissible to express temperatures in the degree Celsius (°C). Temperature differences are best expressed in Kelvin (K).

When compound units involving temperature are used, they should be expressed in terms of Kelvin, e.g. specific heat $J\ kg^{-1}\ K^{-1}$.

2. NOMENCLATURE AND SYMBOLS

Tables 1-5 list recommended symbols for physical quantities. Obviously, historical usage is of considerable importance in the choice of names and symbols and attempts have been made to reflect this fact in the tables. But conflicts do arise between lists that are derived from different disciplines. Generally, a firm recommendation has been made for each quantity, except for radiation where two options are given in Table 5.

In the recommendations for *material properties* (see Table 1), the emission, absorption, reflection, and transmission of radiation by materials have been described in terms of quantities with suffixes 'ance' rather than 'ivity', which is also sometimes used, depending on the discipline. It is recommended that the suffix 'ance' be used for the following four quantities:

$$\text{emittance}\ \varepsilon = \frac{E}{E_b}\left(or\ \frac{M_s}{M_{sb}}\right)$$

$$\text{absorptance}\ \alpha = \frac{\Phi}{\Phi_i}$$

$$\text{reflectance}\ \rho = \frac{\Phi}{\Phi_i}$$

$$\text{transmittance}\ \tau = \frac{\Phi}{\Phi_i}$$

where E and ϕ is the radiant flux density that is involved in the particular process. The double use of α for both absorptance and thermal diffusivity is usual, as is the double use of ρ for both reflectance and density. Neither double use should give much concern in practice.

Table 1: Recommended symbols for materials properties

Quantity	Symbol	Unit
Specific heat	c	J kg^{-1} K^{-1}
Thermal conductivity	k	W m^{-1} K^{-1}
Extinction coefficient+	K	m^{-1}
Index of refraction	n	
Absorptance	α	
Thermal diffusivity	α	m^2 s^{-1}
Specific heat ratio	γ	
Emittance	ε	
Reflectance	ρ	
Density	ρ	kg m^{-3}
Transmittance	τ	

+ In meteorology, the *extinction coefficient* is the product of *K* and the path length and is thus dimensionless.

Table 2: Recommended symbols and sign convention for sun and related angles

Quantity	Symbol	Range and sign convention
Altitude	α	0 to ± 90°
Surface tilt	β	0 to ± 90°; toward the equator is +ive
Azimuth (of surface)	γ	0 to 360°; clockwise from North is +ive
Declination	δ	0 to ± 23.45°
Incidence (on surface)	Θ,i	0 to + 90°
Zenith angle	Θ_z	0 to + 90°
Latitude	Φ	0 to ± 90°; North is +ive
Hour angle	ω	-180° to +180°; solar noon is 0°, afternoon is +ive
Reflection (from surface)	r	0 to + 90°

Table 3: Recommended symbols for miscellaneous quantities

Quantity	Symbol	Unit
Area	A	m^2
Heat transfer coefficient	h	W m^{-2} K^{-1}
System mass	m	kg
Air mass (or air mass factor)	M	
Mass flow rate	$\dot{m}$	kg s^{-1}
Heat	Q	J
Heat flow rate	$\dot{Q}$	W
Heat flux	q	W m^{-2}
Temperature	T	K
Overall heat transfer coefficient	U	W m^{-2} K^{-1}
Efficiency	η	
Wavelength	λ	m
Frequency	ν	s^{-1}
Stefan-Boltzmann constant	σ	W m^{-2} K^{-4}
Time	t, τ, Θ	s

Table 4: Recommended subscripts

Quantity	Symbol
Ambient	a
Black-body	b
Beam (direct)	b
Diffuse (scattered)	d
Horizontal	h
Incident	i
Normal	n
Outside atmosphere	o
Reflected	r
Solar	s
Solar constant	sc
Sunrise (sunset)	sr, (ss)
Total of global	t
Thermal	t, th
Useful	u
Spectral	λ

Table 5: Recommended symbols for radiation quantities

	Preferred name	Symbol	Unit
a)	Nonsolar radiation		
	Radiant energy	Q	J
	Radiant flux	Φ	W
	Radiant flux density	Φ	W m^{-2}
	Irradiance	E, H	W m^{-2}
	Radiosity or Radiant exitance	M, J	W m^{-2}
	Radiant emissive power (radiant self-exitance)	Ms, E	W m^{-2}
	Radiant intensity (radiance)	L	W m^{-2} sr^{-1}
	Irradiation or radiant exposure	H	J m^{-2}
b)	Solar radiation		
	Global irradiance or solar flux density	G	W m^{-2}
	Beam irradiance	G_b	W m^{-2}
	Diffuse irradiance	G_d	W m^{-2}
	Global irradiation	H	J m^{-2}
	Beam irradiation	H_b	J m^{-2}
	Diffuse irradiation	H_d	J m^{-2}
c)	Atmospheric radiation		
	Irradiation	$\Phi\downarrow$	W m^{-2}
	Radiosity	$\Phi\uparrow$	W m^{-2}
	Exchange	Φ_N	W m^{-2}