Article

A Minimal Working Example of a Journal Paper using LaTeX in the MDPI format

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Abstract: Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

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Keywords: Supercritical carbon dioxide Brayton cycle; Concentrating Solar Power (CSP); Lead Fast Reactor (LFR), Cogeneration, Complimentary Cycle, Thermal Energy Storage (TES)

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Published:

1. Introduction

The introduction should briefly place the study in a broad context and highlight why it is important. It should define the purpose of the work and its significance. The current state of the research field should be reviewed carefully and key publications cited. Please highlight controversial and diverging hypotheses when necessary. Finally, briefly mention the main aim of the work and highlight the principal conclusions. As far as possible, please keep the introduction comprehensible to scientists outside your particular field of research.

1.1. Review of Related Work

Discuss existing literature that is related to your work, covering both those sources that you built upon and any work that could be conceived as closely related. Discuss differences in assumptions, methodology, or results that make your work distinct.

2. Materials and Methods

Materials and Methods should be described with sufficient details to allow others to replicate and build on published results.

When annotating, we will use the `changes` package. This allows for redlining and commenting on draft text. There are a bunch of~~several~~ commands that are useful.

[MW 1]: Specify the name of each command!. These include the "replaced," "comment," and "deleted" commands. ~~I wish I learned LaTeX sooner~~.

2.1. Subsection name

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Equation 1 shows a heat exchanger energy balance [1].

$$\dot{m} \cdot h_{in} + \dot{Q}_{HX} = \dot{m} \cdot h_{out}, \tag{1}$$

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Figure 1. ESOLab logo

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Figure 2. UW logo taking the full page width

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Table 1. Standardized constant cycle parameters with definition, variable and set value.

Parameter	Variable	Design Point Value
Efficiencies		
Main Compressor	η_{MC}	0.91 (-)
Re-Compressor	η_{RC}	0.89 (-)
Turbine	η_T	0.90 (-)
Pumps 1-3	η_P	0.90 (-)
Approach Temperatures		
Low Temperature Recuperator	δ_{LTR}	10 (°C)
High Temperature Recuperator	δ_{HTR}	10 (°C)
Concentrating Solar Power Heat Exchanger	δ_{CSPHX}	10 (°C)
Pressures		
Pressure Ratio	PR	3.27 (-)
High Side Pressure	P_{2A}	28.8 (MPa)
Heat Into System		
Lead-Cooled Fast Reactor Heat Transfer	$\dot{Q}_{LFRHX}$	950 (MW)
Concentrating Solar Power Heat Transfer	$\dot{Q}_{CSP}$	750 (MW)
Temperature		
Main Compressor Inlet	T_{1A}	40 (°C)
Lead-Cooled Fast Reactor sCO_2 High Temperature	T_5,T_{2C},T_{6A},T_{5C}	595 (°C)
Pumps		
Pressure Rise Across Pump	Δ_P	3.726 (MPa)
Pump Low Side Pressure	P_{S5-B}	3 (MPa)

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3. Results and Discussion

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4. Conclusions

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Author Contributions: Conceptualization, B.L., M.W., C.S. and T.N.; methodology, B.W., M.W., C.S., T.N. and B.L.; software, B.W.; validation, B.L and M.W.; formal analysis, B.W.; investigation, B.W.; resources, M.W. and B.L.; data curation, B.W.; writing—original draft preparation, B.W.; writing—review and editing, B.L., M.W. and T.N.; visualization, B.W.; supervision, M.W and B.L.; project administration, B.L.; funding acquisition, B.L, M.W, C.S and T.N. All authors have read and agreed to the published version of the manuscript.

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Nomenclature

The following abbreviations and variables are used in this manuscript:

Abbreviations:

A	Alternator
CSP	Concentrating solar power
C2S	sCO_2-to-Salt heat exchanger
EES	Engineering Equation Solver
HTR	High temperature recuperator
HX	Heat exchanger
LFR	Lead-fast reactor
LTR	Low temperature recuperator
MC	Main compressor
NREL	National Renewable Energy Laboratory
P	Pump
PC	Pre-cooler
RC	Re-compressor
sCO_2	Supercritical carbon dioxide
T	Turbine
TES	Thermal energy storage

Variables [Units]:

CR	Capacitance ratio [-]
$\dot{C}$	Capacitance rate [MW/°C]
Δ	Temperature difference [°C]
δ	Approach temperature of heat exchanger [°C]
ε	Effectiveness of heat exchanger [-]
η	Isentropic efficiency [-]
h	Enthalpy [J/kg]
$\dot{m}$	Mass flow rate [kg/s]
NTU	Number of transfer units [-]
P	Pressure [MPa]
$\dot{Q}$	Heat transfer rate [W]
T	Temperature []°C]
UA	Conductivity of heat exchanger [MW/°C]
v	Volumetric flow rate [m^3/kg]
$\dot{W}$	Power [MW]
y	Splitter fraction [-]

References

1. Blair, N.; DiOrio, N.; Freeman, J.; Gilman, P.; Janzou, S.; Neises, T.; Wagner, M. System advisor model (SAM) general description (Version 2017.9. 5). *National Renewable Energy Laboratory: Golden, CO, USA* **2018**, pp. 1–19.