Matrices with Matlab

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1 Introduction

[Background on the topic]

1. In the first section we will describe the process toward which the results of the project were obtained.

2. The section presents the results we obtained with...

The introduction should state clearly why the study was started and give a relatively short and essential overview of the topic you are exploring. References to previous works can be made here.

The introduction should not contain the conclusions. At the end of the introduction the outline of the paper may be described.

2 Methods

Here you describe the strategy you adopted and the tools you used in your study.

2.1 Example of subsection

This is a subsection.

2.1.1 Example of subsubsection

This is a sub-subsection.

2.2 Example of mathematical formulas

LaTeXis a very powerful tool when it comes to typesetting of mathematical equations. The quality of the output is extremely high and hardly matched by other word processors. It takes little time with LaTeX to learn how to handle even complicated mathematical expressions.

$$\begin{aligned} f(x) &= \frac{x+1}{2x-3} \\ K &= \frac{\sqrt{32}}{\pi}\frac{1}{\delta}\frac{\tau_{\mathrm{ff}}}{\tau_{\mathrm{co}}}\,; \end{aligned} \tag{1}$$

$$\begin{aligned} \mathrm{a}x^2 + \mathrm{b}x + \mathrm{c} = 0 \\ \mathrm{d}x^2 + \mathrm{e}x + \mathrm{f} = 0 \end{aligned}$$

LaTeX uses a simple and convenient system for assigning numbered labels to equations and other objects (figures, tables, etc...) and for referring to them. After having edited the source file and rearranged the position of the equations, LaTeX will change labels and references consistently throughout the text (if you did the things right of course...)

Examples of text containing mathematical expressions and equations:

M_r	mass internal to the radius r
m	mass of the zone
r_0	unperturbed zone radius
ρ_0	unperturbed density in the zone
T_0	unperturbed temperature in the zone
L_{r0}	unperturbed luminosity
$E_{\rm th}$	thermal energy of the zone

$$\tau_{\rm co} = \frac{E_{\rm th}}{L_{r0}}\,, \tag{2}$$

$$\tau_{\rm ff} = \sqrt{\frac{3\pi}{32G}\frac{4\pi r_0^3}{3M_{\rm r}}}\,, \tag{3}$$

$$\frac{dy}{dx} = \langle x^2 - y^2 \rangle \tag{4}$$

$$\frac{dy}{dx} = \left(x^2 - y^2 \right) \tag{5}$$

$$\frac{dy}{dx} = [x^2 - y^2] \tag{6}$$

$$\frac{\mathcal{R}dy}{\mathbf{E}dx} = \langle x^2 - y^2 \rangle \tag{7}$$

$$\nabla_{\rm ad} = \left(\frac{\partial \ln T}{\partial \ln P}\right)_S\,,\ \chi_T = \left(\frac{\partial \ln P}{\partial \ln T}\right)_\rho\,,\ \kappa_T = \left(\frac{\partial \ln \kappa}{\partial \ln T}\right)_T$$

$$\frac{\pi^2}{8}\frac{1}{\tau_{\rm ff}^2}(3\Gamma_1 - 4) > 0 \tag{8}$$

$$\frac{\pi^2}{\tau_{\rm co}\tau_{\rm ff}^2}\Gamma_1\nabla_{\rm ad}\left[\frac{1 - 3/4\chi_\rho}{\chi_T}(\kappa_T - 4) + \kappa_P + 1\right] > 0 \tag{9}$$

$$\frac{\pi^2}{4}\frac{3}{\tau_{\rm co}\tau_{\rm ff}^2}\Gamma_1^2\,\nabla_{\rm ad}\left[4\nabla_{\rm ad} - (\nabla_{\rm ad}\kappa_T + \kappa_P) - \frac{4}{3\Gamma_1}\right] > 0 \tag{10}$$

2.3 Example of verbatim text

In LaTeX You can enter text `verbatim`: that means that LaTeX will print it exactly as you enter it in the source file. The output resembles closely the one from old typewriters and it is usually good to print out portions of computer code:

```
PROGRAM area
REAL base, height, area
PRINT *,'Enter the values for the base and height of a triangle.'
READ *, base, height
area = (1.0/2.0) * base * height
```

```
PRINT *,'The area of a triangle with base ', base
PRINT *,'and height ', height,' is ', area
STOP
END
```

Note: In `verbatim` mode you can easily end up outside the margins, as in the example above: pay attention to that!

3 Imported Section

Imported Section here!

3.1 Lists

Example of a list with numbered items:

1. Planets, asteroids, moons ...
2. Stars, galaxies, quasars

Example of a list with unnumbered items:

- Planets, asteroids, moons ...
- Stars, galaxies, quasars

4 Results

In this section you present your findings and results.

5 Tables and figures

Figures demonstrate and prove conclusions. They should convince the reader, preferably at first glance. Figures should be self-explanatory. The legends should have a well-defined meaning. The lettering and the thickness of lines and symbols should be large enough to remain recognizable after printing.

The figure captions should contain all the information needed to understand the data presented and references to the text of the paper should be minimized.

```
//color value
float colorValue = 1.0f;

//deltaColor = rate of change for color
float deltaColor = -0.002f;

// set up vertex data (and buffer(s)) and configure vertex attributes
// ------------------------------------------------------------------
float vertices[] = {
    // positions         // colors
     0.5f, -0.5f, 0.0f,  colorValue, 0.0f, 0.0f,  // bottom right
    -0.5f, -0.5f, 0.0f,  0.0f, colorValue, 0.0f,  // bottom left
     0.0f,  0.5f, 0.0f,  0.0f, 0.0f, colorValue   // top
};
```

Figure 1: This image shows code containing the Vertices variable.

Figure 1 demonstrates the code used...

Tables should be self-explanatory. The table headings should contain the essential information needed to understand the data presented. Details should not clutter the header and are better added as explanatory footnotes. 1 We will see

Source	$T/[\mathrm{K}]$
Yorke 1979, Yorke 1980a	≤ 1700
Krügel 1971	$1700 \leq T \leq 5000$
Cox & Stewart 1969	$5000 \leq$
Los Angeles	3000
Paris	2

Table 1: Example of table caption: opacity sources.

6 Discussion

In this section you analyse and discuss your results. This section is paramount as it gives indication about the hability of the author to interpret the results and critically discuss his or her findings.

7 Conclusions

Here you summarize the essential aspects and findings of your work and analysis.

Finally, remember to include a section with the bibliography. It is very important to cite the sources you used for your study and for writing the report.

Value 1 α	**Value 2** β	**Value 3** γ	**Value 4** δ
1	1110.1	100	a
2	10.1	50	b
3	23.113231	5	c
800	800	1	dd
900	850	-10	ddd

Table 2: Your first table.

Table 3: Partial horizontal line

X	X	X	X
X	X	X	X
X	X	X	X

References

[1] Baker, N. 1966, in Stellar Evolution, ed. R. F. Stein & A. G. W. Cameron (Plenum, New York) 333

[2] Balluch, M. 1988, A&A, 200, 58

[3] Cox, J. P. 1980, Theory of Stellar Pulsation (Princeton University Press, Princeton) 165

[4] Cox, A. N.,& Stewart, J. N. 1969, Academia Nauk, Scientific Information 15, 1

[5] Mizuno H. 1980, Prog. Theor. Phys., 64, 544

[6] Tscharnuter W. M. 1987, A&A, 188, 55

[7] Terlevich, R. 1992, in ASP Conf. Ser. 31, Relationships between Active Galactic Nuclei and Starburst Galaxies, ed. A. V. Filippenko, 13

[8] Yorke, H. W. 1980a, A&A, 86, 286

[9] Zheng, W., Davidsen, A. F., Tytler, D. & Kriss, G. A. 1997, preprint