

A few tips for preparing reports

October 2021

1. Abstract

In the abstract, we provide the purpose of the measurements, the method we used and the main results with uncertainties. We do not include information that is irrelevant at this stage, e.g. “the system was adjusted”, “I built the system”, “I changed the current”, but we write: “The method X was used to measure Y and the result was $z \pm \Delta z$ for the current I ”. Likewise, our focus is not on the fact that this is a student exercise, but on what was measured and how. Therefore, we do not write “During this laboratory I measured the Earth’s magnetic field.” An example of a proper abstract is provided below:

The Zeeman effect was observed in the direction transverse and longitudinal with respect to the direction of the magnetic field. The green mercury line $\lambda = 546.1$ nm was spectrally resolved with a pressure-tuned Fabry-Pérot interferometer. For π transitions, the following line splittings were determined: $\Delta E_1 = 0.367 \pm 0.016$ cm⁻¹, $\Delta E_2 = 0.341 \pm 0.015$ cm⁻¹ and $\Delta E_3 = 0.300 \pm 0.010$ cm⁻¹ for the solenoid currents of 25, 30 and 40 A, respectively.

Tip mainly for the future — we do not provide references to formulas or literature in the standard form (1) or [1] in the abstracts. This is because the abstracts are collected separately in many databases, and out of context, such references do not provide any information.

2. Rounding results

We round off the results and uncertainties at the very end of all the calculations. First, we round up the uncertainties to 2 significant figures. Remember that significant figures have nothing to do with the number of decimal places. In the next step we round the result to the same decimal place as the uncertainty. For example:

$$1.87654 \pm 0.02313 \rightarrow 1.877 \pm 0.024$$

$$112.23 \pm 1.332 \rightarrow 112.2 \pm 1.4$$

$$1234.1234 \pm 12.45 \rightarrow 1234 \pm 13$$

$$1235.1234 \pm 123.56 \rightarrow 1240 \pm 130$$

Remember that we cannot skip zero if it appears in the last decimal place of our properly rounded result. The reason is that this zero also carries information:

$$51.0 \pm 0.1 \text{ not } 51 \pm 0.1.$$

3. Fitting

The parameters found in the fitting procedure have to be correctly rounded and provided with units and uncertainties. Directly pasting the table generated by the Origin software is unacceptable, because: there are no units there, the values are not rounded, and often there is no fitted function formula, or if it is shown, it is in an unreadable form:

Model	Gauss		
Equation	$y=y_0 + (A/(w*\sqrt{\pi/2}))*\exp(-2*((x-x_c)/(w))^2)$		
Reduced Chi-Sqr	1.46772557		
Adj. R-Square	0.99622859		
		Value	Standard Error
D	y0	0.022385	0.00552024
D	xc	1.915541	0.02754402
D	w	1.005514	0.04729922
D	A	0.568396	0.0341703
D	sigma	0.502757	0.02364961
D	FWHM	1.183902	0.05669057
D	Height	0.451027	0.00890285



$$y = y_0 + \frac{A}{w\sqrt{\pi/2}} e^{-2\left(\frac{x-x_c}{w}\right)^2}$$

$$y_0 = 0.0224 \pm 0.0056 \text{ V}$$

$$x_c = 1.916 \pm 0.028 \text{ s}$$

$$w = 1.006 \pm 0.048 \text{ s}$$

$$A = 0.568 \pm 0.035 \text{ Vs}$$

4. Formulas

After the formulas, we use punctuation as in a sentence, i.e. we put commas or periods. For example:

The area S of a circle is

$$S = \pi r^2,$$

where r is its radius.

In \LaTeX we get properly looking brackets using `\left(` (and `\right)`) instead of common `(` (and `)`):

$$\left(\frac{\sqrt{a}}{\sqrt{b}}\right) \rightarrow \left(\frac{\sqrt{a}}{\sqrt{b}}\right)$$

5. Graphs

We take care of the clarity of charts and the legibility of axis descriptions, numbers and legends. When presenting several data sets on one graph, individual sets (e.g. curves) must be clearly distinguishable, if necessary — also when printing in grayscale (red and green lines will look almost the same in grayscale — then use different line thicknesses or dashed lines, dotted lines etc.).

6. Units

The correct notation of units is 10 m/s^2 , i.e. there is a space between the number and the unit, and the unit is written with a regular font, not with italic one. A common misspelling is for example $10m/s^2$.

7. Symbols in the text

The symbols used in the text should look exactly like those used in the equations. We achieve this by writing symbols inside $\$$ $\$$. For example:

t denotes time and p denotes momentum.

8. Quotation marks

Proper quotation marks are “text”, not "text".

9. References to equations, figures and literature

- Numbers of the equations should be in round brackets, e.g. from equation (6) it follows that...
- References to the literature should be written in square brackets, e.g. in [1] it was proposed...
- References to the figures should be written without parentheses, e.g. in Fig. 1 we see...

10. Items at the end of a line of text

We avoid splitting numbers and units at the end of a line of text. In Word we use the non-breaking space `ctrl-shift-space`, and in \LaTeX we use the tilde character `~`:

123~Gs. Of course, the tilde mark is not visible in the text. An example is shown below:

...At the beginning, the value of the current in the first and second electromagnet was set to 40 A. In the next step...

↓

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11. Before submitting the report

We pay attention to: the quality of the graphs, the presence of symbols (e.g. Greek letters), the presence and proper appearance of formulas. When preparing text for printing, we must remember that the typical required resolution of raster graphics is 300 DPI. What appears legible on a computer screen (96 DPI) is unacceptable in print.

Tomasz Kawalec