Terry Sturtevant

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Terry Sturtevant Lab Exercise - Processing Uncertainties

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What was important in the previous exercises?

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What was important in the previous exercises?



uncertainties in measurements

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What was important in the previous exercises?

uncertainties in measurements precision measure for digital instruments

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uncertainties in measurements precision measure for digital instruments precision measure for analog instruments

- uncertainties in measurements precision measure for digital instruments precision measure for analog instruments
- 2 uncertainty in the average

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- uncertainties in measurements precision measure for digital instruments precision measure for analog instruments
- ② uncertainty in the average bigger of the precision measure and the standard deviation of the mean

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- uncertainties in measurements precision measure for digital instruments precision measure for analog instruments
- 2 uncertainty in the average

bigger of the precision measure and the standard deviation of the mean

how to improve the experiment

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- uncertainties in measurements precision measure for digital instruments precision measure for analog instruments
- 2 uncertainty in the average

bigger of the precision measure and the standard deviation of the mean

how to improve the experiment

3 agreement of quantities with uncertainties

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Uncertainties in Calculated Results

Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Uncertainties in Calculated Results

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Uncertainties in Calculated Results

• Since measured values have uncertainties, anything calculated using those uncertain quantities also has uncertainty.

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Methods of Calculating Uncertainties

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Methods of Calculating Uncertainties

algebra

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Methods of Calculating Uncertainties

- algebra
- inspection

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Methods of Calculating Uncertainties

- algebra
- inspection

Both should give similar results; some situations may make one or the other easier.

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Sensitivity of Final Uncertainties

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Sensitivity of Final Uncertainties

To improve an experiment:

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Sensitivity of Final Uncertainties

To improve an experiment:

I Find out which quantity has the biggest effect on the total uncertainty.

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Sensitivity of Final Uncertainties

To improve an experiment:

- Find out which quantity has the biggest effect on the total uncertainty.
- ② Change something about the experiment to reduce the uncertainty in this quantity.

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Sensitivity of Final Uncertainties

To improve an experiment:

- Find out which quantity has the biggest effect on the total uncertainty.
- ② Change something about the experiment to reduce the uncertainty in this quantity.

This process can be repeated.

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Final Points

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Final Points

All uncertainties should be either:

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Final Points



measured; such as the precision measure of any instrument

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Final Points

All uncertainties should be either: measured; such as the precision measure of any instrument calculated; such as the due to statistical analysis or propagation

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Final Points

 All uncertainties should be either: measured; such as the precision measure of any instrument calculated; such as the due to statistical analysis or propagation bounded; such as due to experimental factors

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Uncertainties in Calculated Results Methods of Calculating Uncertainties Sensitivity of Final Uncertainties Final Points

Final Points

All uncertainties should be either:

measured; such as the precision measure of any instrument **calculated**; such as the due to statistical analysis or propagation

bounded; such as due to experimental factors

Only uncertainties of these types should be discussed; avoid speculation about other "possible" things.

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