Measuring resistance using non-ideal devices

Latipov Vladimir && Onishenko Sergiy

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Contents

1 Abstract

It tends to be pretty difficult and obviously not convenient to perform measurements using voltage and current sensors whose impedance is comparable with the impedance of resistor itself.
That's why it makes sense to apply optimization methods to improve accuracy.
So, we've constructed all of the possible schemes and proved, that there aren't any other reasonable schemes can be constructed using the given set of instruments.
Finally, we've extracted all the data from those schemes.

2 The Plan

The task is to measure the impedance of the given resistor as precise as possible.
To achieve this aim, we decided to perform these operations:

1. Compute the resistance and its dispersion individually for each scheme
2. Deduct which scheme's results stand out from the center (μ), for example, the threshold value of remoteness from the center might be equal to $2 \cdot \sigma$
3. Dropout the data outliers (outstanding measurements)
4. For those verified measurements we use them to construct an equation system.
5. Optimize the function which is $\sum_{i=0}^{i<n_{equations}} (EQ_{i_{left}} - EQ_{i_{right}})^2$
   where $EQ_{i_{left}}$ and $EQ_{i_{right}}$ are left and right sides of i^{th} equation respectively