

Accuracy & Precision

Physics

Two different things that are routinely confused.

Accuracy

- Closeness to the true value
- Reduced by systematic error
- Fixed by calibration
- Cannot improve by repeating
- Needs a known reference

Precision

- Closeness of repeats to each other
- Limited by random error
- Improved by averaging repeats
- Set by instrument resolution
- Measurable without a reference

THE DIFFERENCE THAT MATTERS

A miscalibrated instrument gives precise, tightly clustered, and consistently wrong results. Repeats will never reveal it.

Random error scatters both ways and averages out. Systematic error shifts everything one way and does not.