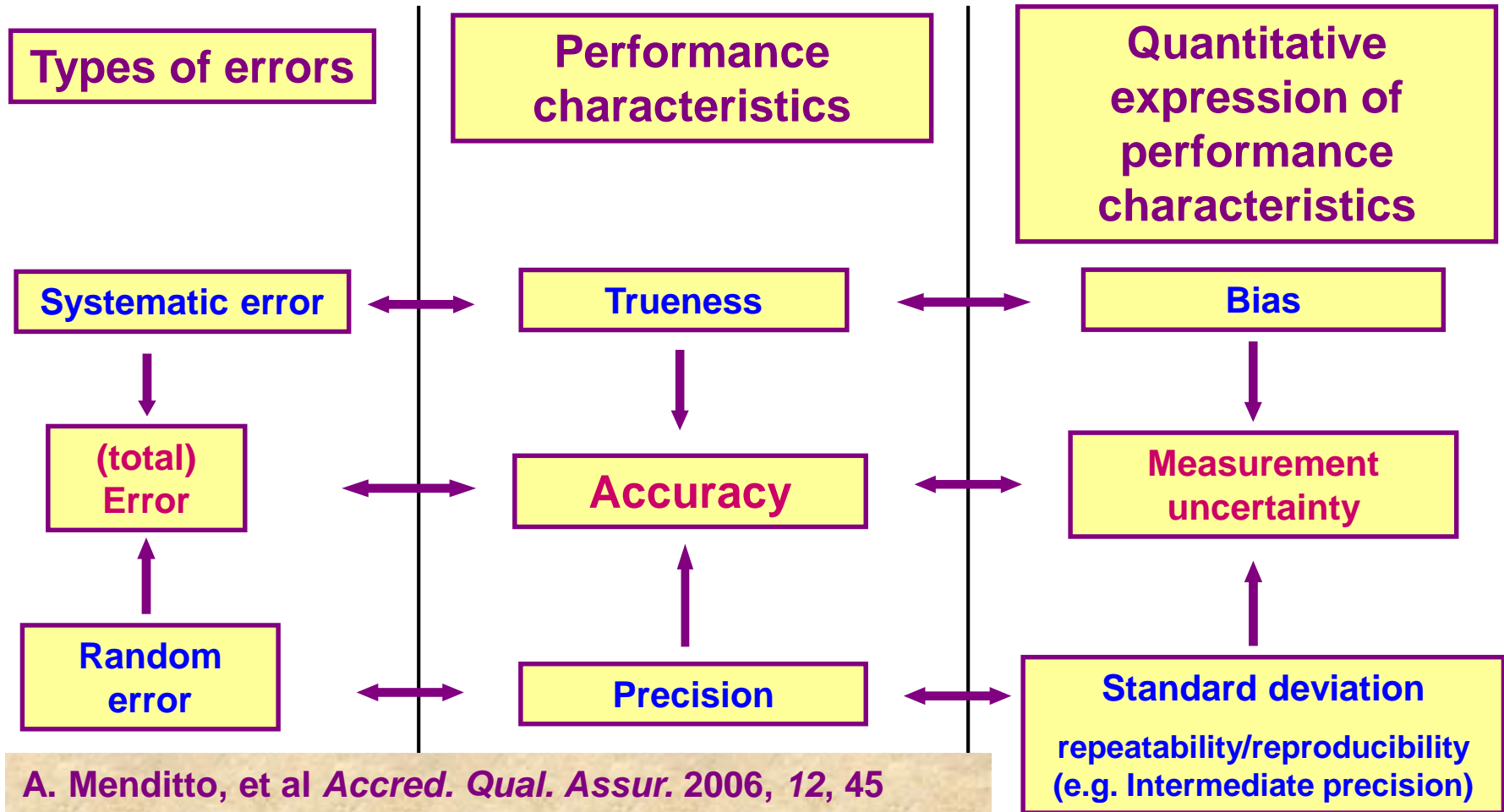
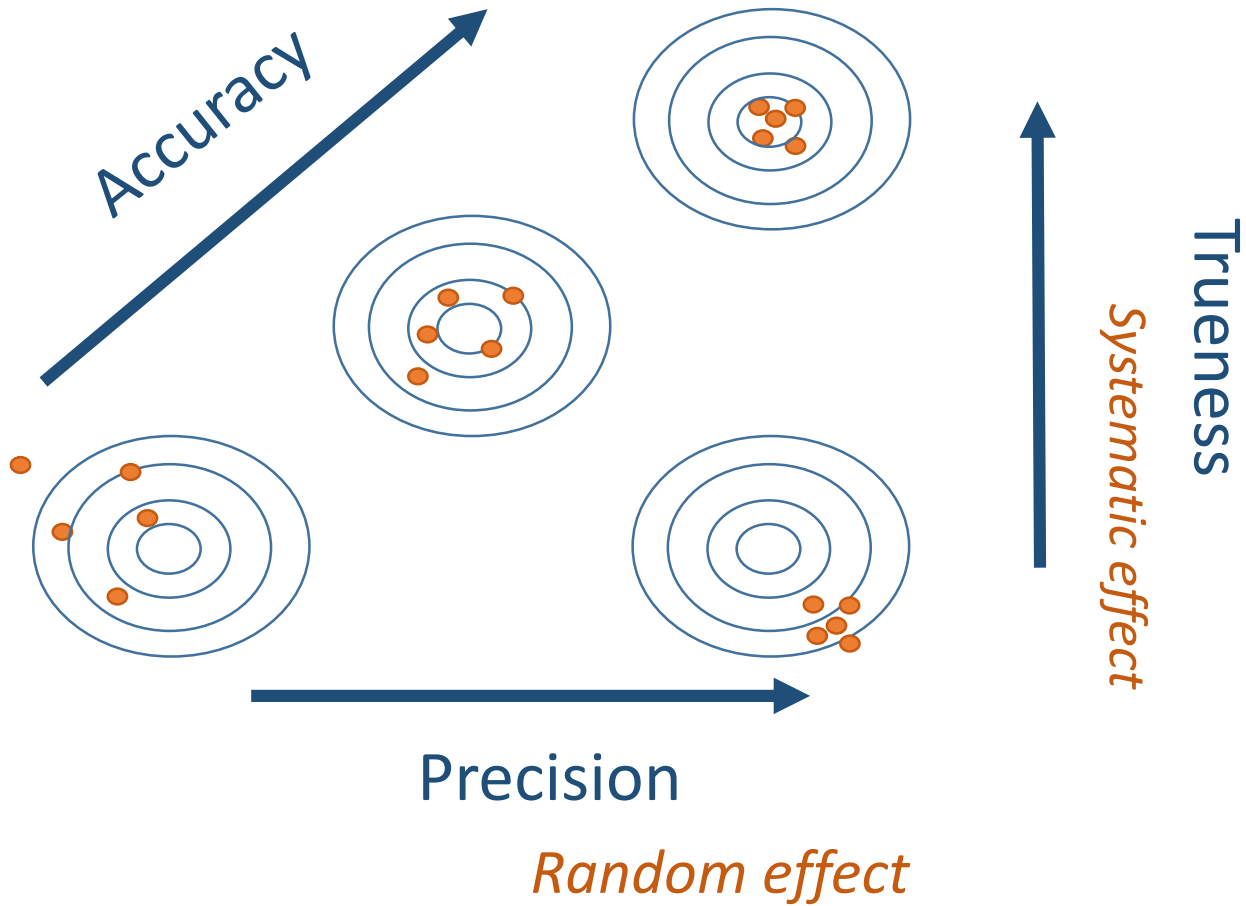


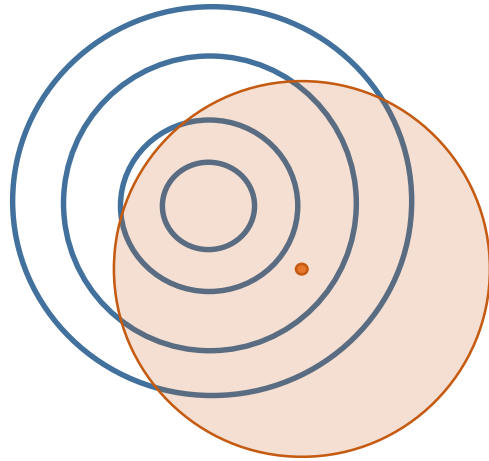
Accuracy and measurement uncertainty

Section 7

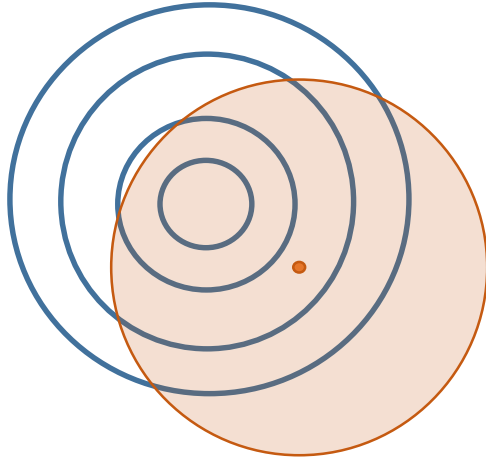




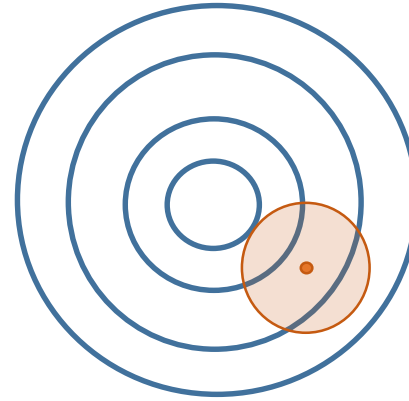
How does measurement uncertainty fit to
this picture?



Which method is more accurate?

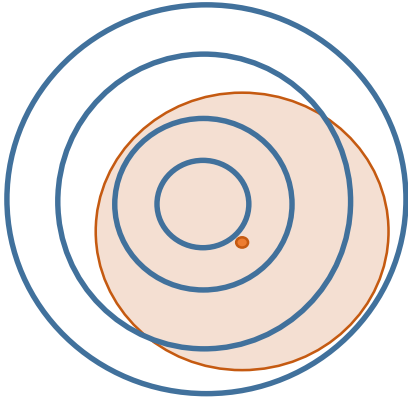


If uncertainty is acceptable to the customer then method is OK.

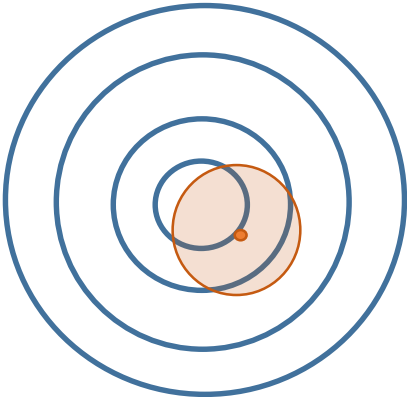


Method is not accurate enough and the uncertainty estimation should be reviewed.

Which method is more accurate?



Less accurate



More accurate

Uncertainty estimation approaches

**Based on
modelling**

**Uncertainty data of
many parameters
are used**

**Rigorous but
work-intensive and
needs competence**

**Based on
validation data**

**Intermediate precision
and long-term bias
data are used**

**Less rigorous but
easy to apply in a
routine lab**

Using validation data for uncertainty

Effects contributing to uncertainty

Random

Systematic

$$u_c = \sqrt{u_1^2 + u_2^2}$$

Uncertainty from long-term random effects

Uncertainty accounting for long-term bias

*There is a Dedicated MOOC for
measurement uncertainty:*

**Estimation of measurement
uncertainty in chemical analysis**

<https://sisu.ut.ee/measurement/>