

**VALIDATION
TRACEABILITY
MEASUREMENT UNCERTAINTY
CHALLENGES FOR THE 21ST CENTURY'S ANALYSTS**

Workshop group 2.4:
Are the new numerical methods for MU estimation applicable in the analytical laboratories?

Convener: Alex Williams
Rapporteur: Milena Funk



Workshop group 2.4 – participants:

- Bartl, Benjamin (D)
- Ertas, Hasan (TR)
- Funk, Milena (D)
- Gödde, Markus (D)
- Golze, Manfred (D)
- Gundrum, Christina (D)
- Hill, Peter (D)
- Hutter, Jaap-Willem (NL)
- Kappler, Claudia (D)
- Karakaya, Mevlana (TR)
- Kaus, Rüdiger (D)
- Novikov, Volodymyr (UA)
- Pum, Joachim (D)
- Sander, Norman (D)
- Todoric, Ijiljana (SLO)
- Wiegner, Katharina (D)

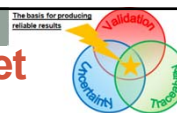
WG 2.4 questions

- How often is the Kragten spreadsheet used to calculate the uncertainty?
- What is the level of awareness about Monte Carlo Simulations?
- Has it been utilised in your laboratory?
- What software is available?
- What are its advantages?
- What are its disadvantages?



a) How often is the Kragten spreadsheet used to calculate the uncertainty?

- Most participants implemented Kragten spreadsheet
- Experience with Kragten:
 - with covariance Kragten failed
 - two possibilities to implement covariance:
 1. paper of Steve Ellison
 2. add a separate factor to account for correlation
 - makes numerical calculations more easy
 - examples of the guide are solved in Excel



b) What is the level of awareness about Monte Carlo Simulations?

- Most participants have not implemented MC
- One participant has implemented MC but not on a routine basis
- Example: Influence of measurement uncertainties on the determination of the Weibull distribution 2012 (Bermejo, Supancic, Danzer) Journal of the European Ceramic Society 32 (2012) 251–255
- 2nd differential term makes the difference



d) What software is available?

- what are the advantages?
- what are its disadvantages?

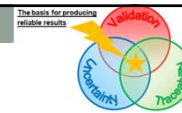
- Software available:
 - software @Risk from Palisade can be added to Excelexamples were shown

advantages:

- Proof for mistakes

Disadvantages:

- Step by step calculations have less mistakes (distribution model)



Additional subjects discussed

- No intrinsic difference between type A and type B (GUM)
- Difference only about deriving the information

