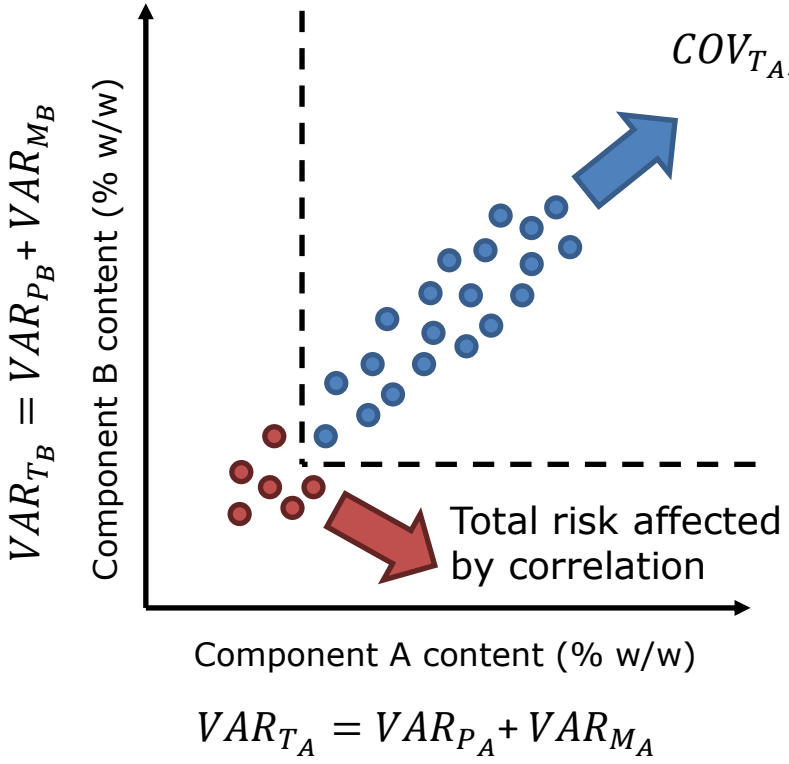
Determination of intrinsic and metrological correlations of components of a product - impact on risks of false decisions in conformity assessment

Luciana Separovic, Ricardo J. N. B. da Silva and Felipe R. Lourenço

$$COV_{T_A;T_B} = COV_{P_A;P_B} + \cancel{COV_{P_A;M_B}}^{0} + \cancel{COV_{P_B;M_A}}^{0} + COV_{M_A;M_B}$$

Intrinsic correlation

Metrological correlation



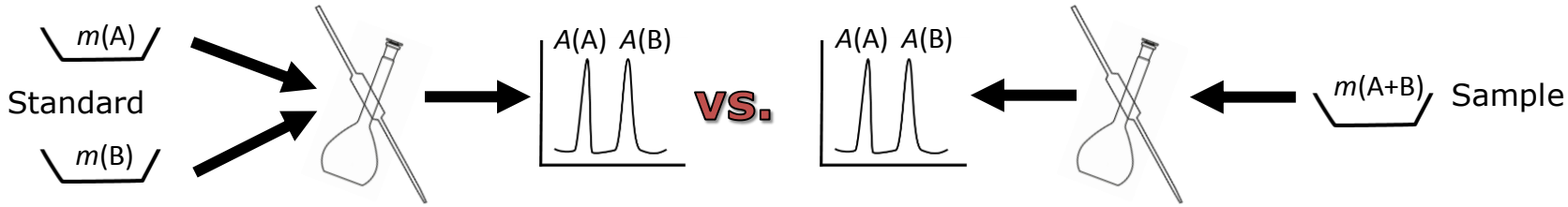
$$VAR_{T_A} = VAR_{P_A} + VAR_{M_A}$$

Legend:

VAR	Variance
COV	Covariance
T	Total
P	Process
M	Measurement
A	Component A
B	Component B
r	Correlation

Correlated measurements of components A and B

$r_{P_A;P_B}$~87% and $r_{M_A;M_B}$~13%



Independent measurements of components A and B

$r_{M_A;M_B} = 0$ and $r_{T_A;T_B} = r_{P_A;P_B}$