Statistical Methods in Particle Physics

Quiz on chapter 3: Uncertainties

Prof. Dr. Klaus Reygers (lectures)
Dr. Sebastian Neubert (tutorials)

Heidelberg University
WS 2017/18

Please connect to

http://pingo.upb.de/276848

Suppose the average number of proton-proton collisions per bunch crossing at an interaction point of the LHC is 25. What is the variance of the number or collisions per bunch crossing?

1. 5
2. 12.5
3. 25
4. 625

Suppose the average number of proton-proton collisions per bunch crossing at an interaction point of the LHC is 25. What is the variance of the number or collisions per bunch crossing?

1. 5
2. 12.5
3. 25
4. 625

The uncertainty of the sum $z = x + y$ of two uncorrelated variables x and y is given by the square root of

1. the uncertainties of x and y added in quadrature
2. the relative uncertainties of x and y added in quadrature
3. uncertainties of x and y added linearly
4. the absolute values of the relative uncertainties of x and y added linearly

The uncertainty of the sum $z = x + y$ of two uncorrelated variables x and y is given by the square root of

1. the uncertainties of x and y added in quadrature
2. the relative uncertainties of x and y added in quadrature
3. uncertainties of x and y added linearly
4. the absolute values of the relative uncertainties of x and y added linearly

Using linear error propagation, the relative uncertainty of the product $z = x \times y$ of two uncorrelated variables x and y is given by the square root of

1. the uncertainties of x and y added in quadrature
2. the relative uncertainties of x and y added in quadrature
3. the product of the relative uncertainties of x and y
4. the absolute value of the product of the relative uncertainties of x and y

Using linear error propagation, the relative uncertainty of the product $z = x \times y$ of two uncorrelated variables x and y is given by the square root of

1. the uncertainties of x and y added in quadrature
2. the relative uncertainties of x and y added in quadrature
3. the product of the relative uncertainties of x and y
4. the absolute value of the product of the relative uncertainties of x and y

Linear error propagation of two correlated measurements x and y

1. is identical to the case of uncorrelated measurements
2. is possible if the covariance matrix of x and y is known
3. can only be done numerically (Monte Carlo error propagation)
4. is not possible

Linear error propagation of two correlated measurements *x* and *y*

1. is identical to the case of uncorrelated measurements
2. is possible if the covariance matrix of *x* and *y* is known
3. can only be done numerically (Monte Carlo error propagation)
4. is not possible

In the weighted average of n measurements with uncertainties σ_i, the weight of each measurement is proportional to

1. σ_i
2. σ_i^2
3. $1 / \sigma_i$
4. $1 / \sigma_i^2$

In the weighted average of n measurements with uncertainties σ_i, the weight of each measurement is proportional to

1. σ_i
2. σ_i^2
3. $1 / \sigma_i$
4. $1 / \sigma_i^2$