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correlation coefficient

A measure of the degree of interrelationship which exists between two measured quantities, x and y; the correlation coefficient (r) is defined by the following relation:

$$r = \frac{\sum_{i=1}^{n} (x_i - \bar{x})\,(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \sum_{i=1}^{n} (y_i - \bar{y})^2}}$$

where x_i and y_i are the measured values in the ith experiment of n total experiments, $\bar{x}$ and $\bar{y}$ are the arithmetic means of x_i and y_i:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

(similar expression for $\bar{y}$). The linear correlation coefficient indicates the degree to which two quantities are linearly related. If $x = a\,y$ is followed then $r = 1$, and departures from this relationship decrease r; if interpretations of data based on the linear correlation coefficient are to be made, one should consult a book on statistics.

Source:
PAC, 1990, *62*, 2167 *(Glossary of atmospheric chemistry terms (Recommendations 1990))* on page 2182

