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To determine which locations contribute most to the time variations of cloud properties, we propose to compute 1) a time record of the global cloud property anomaly by subtracting from a particular month's value the average for that month over the time record and 2) these time records for each location of the globe. In a next step correlations have to be computed between the anomaly of the global mean and that of each location. Finally the correlation coefficients can be mapped. This map of correlation coefficients indicates which regions contribute to (or oppose) the global mean anomalies.

1) calculate anomaly maps per month and per year (A)

2) calculate global anomaly per month and per year (AG)

3) determine map of (linear) correlation coefficients

A: anomaly per gird box, AG: global anomaly; r: linear correlation coefficient

$$A(i,j,m,y) = \mathrm{var}(i,j,m,y) - \frac{\sum_{y=1}^{YY} \mathrm{var}(i,j,m,y)}{yy}$$

$$AG(m,y) = \frac{\sum_{i=1}^{360} \sum_{j=1}^{180} \mathrm{var}(i,j,m,y) \times area(i,j)}{\sum_{i=1}^{360} \sum_{j=1}^{180} area(i,j)} - \frac{\sum_{y=1}^{YY}\sum_{i=1}^{360} \sum_{j=1}^{180} \mathrm{var}(i,j,m,y) \times area(i,j)}{yy \times \sum_{i=1}^{360} \sum_{j=1}^{180} area(i,j)}$$

$$area(i,j) = \sin[90° - lat(j)]$$

$$r(i,j) = \frac{\sum_{y=1}^{yy} \sum_{m=1}^{12} A(i,j,m,y) \times AG(m,y)}{\sqrt{\sum_{y=1}^{yy} \sum_{m=1}^{12} A(i,j,m,y)^2 \times AG(m,y)^2}}$$