

### **A statistical framework for grading approaches**

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Recently a large effort was undertaken to evaluate climate-chemistry models with respect to stratospheric concentrations and processes. In order to a) get a systematic overview on the results and b) to have a weighting function for the calculation of multi-model means grading formulas were introduced, which give a grading between 0 (bad) and 1 (good). Recently, it was questioned, whether these gradings are statistically significant, basically because the variability of the observational and model data is that large that the confidence interval for the grading parameter is too large to be reasonably be interpreted. Here we propose a methodology, which converts any grading into a statistically significant grading, by calculating the minimum value of its confidence interval. We show examples for stratospheric water vapor measurements (HALOE) in comparison to climate-chemistry model data (CCMVAL-2) and investigate the impact of measurement uncertainties on the model grading.