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## Influence of Vertical Resolution on the Validation of Atmospheric Chemistry Instruments

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### ABSTRACT

A large number of validation campaigns for atmospheric chemistry instruments are being carried out and more such studies will be performed in the future. The aims of validation are to confirm the accuracy and precision of the measurement of a new instrument. There are many factors that may deteriorate the validation results and one of them is the vertical resolution of instruments when using the profiles intercomparison approach. The influence from the vertical resolution can be eliminated by using the averaging kernel method but it is necessary to find the conditions for using the method. This study simulated the influence of vertical resolution for a certain curvature. The results show that both the curvature of a profile and the difference of vertical resolution between two instruments have positive correlation with the differences between their measurements. The quantitative estimations of influence for some practical vertical resolutions were obtained. The combined error of two instruments was defined as the criteria to judge the significance of influence. A case study based on the simulated results was demonstrated to show when the influence from the vertical resolution should be considered and when such influence can be omitted in order to avoid some unnecessary works in validation.

### KEYWORDS

Simulation, Validation, Vertical Resolution, Atmospheric Chemistry Instrument

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