

Combination on NEQ/obs. level

Comparison of combination on NEQ and on observation level

- if analysis softwares are homogenized

NEQ level	Observation level
Consistent processing of the data using the same models and parameterization	
Appropriate relative weighting of the techniques	
Corrections to the original observations are estimated	
Outlier detection and weighting of observations technique-wise	Outlier detection and weighting of observations within the combination process – based on all obs. data
A priori reduced parameter cannot be handled anymore	All parameters are available / can be handled

Combination on NEQ/obs. level

Comparison of combination on solution, NEQ and on observation level - if analysis softwares are homogenized

Solution level	NEQ level	Observation level
Consistent processing of the data using the same models and parameterization		
Appropriate relative weighting of the techniques		
Constraints necessary for solving the solution	Constraint free NEQ or OEQ	
Correction of parameters (vTP_v = square sum of the residuals of parameters)	Corrections to the original observations are estimated (vTP_v = square sum of observation residuals)	

Combination on NEQ/obs. level

Comparison of combination on NEQ and on observation level

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Solution/ NEQ level	Observation level
Outlier detection and weighting of observations technique-wise	Outlier detection and weighting of observations within the combination process – based on all obs. data
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Combination on NEQ/obs. level

Comparison of combination on NEQ and on observation level

- if analysis softwares are homogenized
- **combination on NEQ and OEQ level are identical**, if
 - the data are processed homogeneously
 - we assume, that outlier detection and weighting of observations do not benefit from the observations of another technique
- **combination of solution level is very different** from the other two types as the input data are parameters
 - example: Combination of UT1 from Intensive sessions and GPS LOD
 - on NEQ and OEQ level the data can be combined directly
 - on solution level constraints for the pole coordinates and station coordinates have to be applied for solving the Intensive session → results are affected by these constraints