

What about cross-network homogeneity?



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- Part I – Cross-network homogeneity
- Part II – Example: use of SHC recalibration
- Conclusion

Cross-network homogeneity

→ Controlled changes

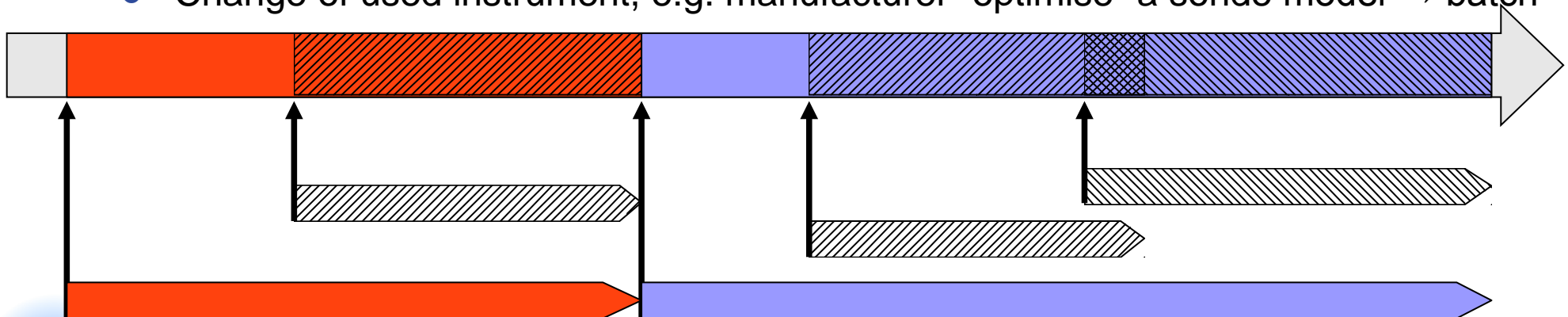
- Switch instrument, e.g. from RS92 to RS41
- Change of operators
- Optimise operational procedures
 - ◆ Change a step → e.g. duration of a GC
 - ◆ Add a new step → e.g. introduce a new GC (like the SHC)
 - ◆ Leave a step out → e.g. pre-treatment of balloon

Inhomogeneity

- at one site
- over time

→ Uncontrolled changes

- Change of used instrument, e.g. manufacturer “optimise” a sonde model → batch



→ Operational procedures

- with SHC ↔ without SHC

→ Location (e.g. altitude, position)

- sea level ↔ mountain

→ Used instrument model

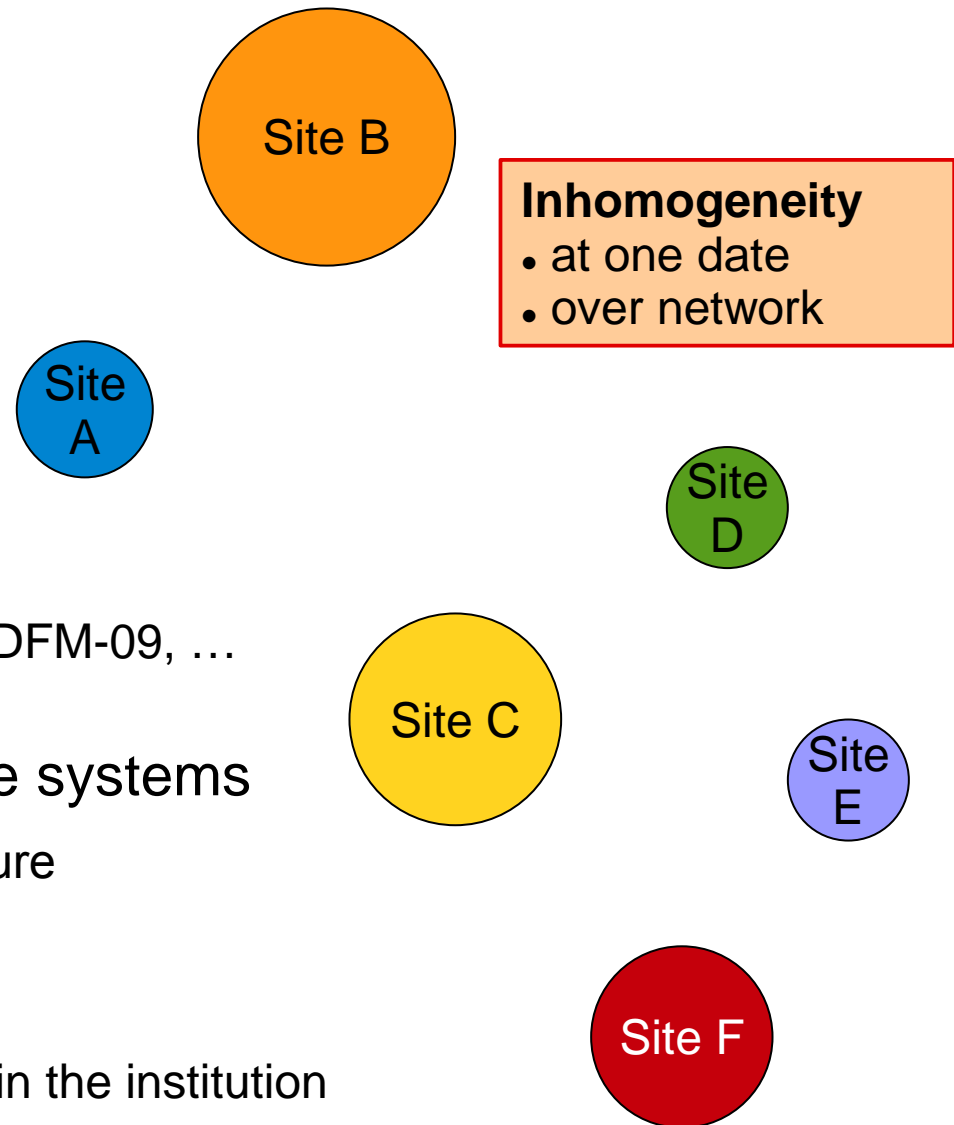
- e.g. RS92, SRS-C34, RS-11G, M10, DFM-09, ...

→ Version & configuration of software systems

- Activate ↔ deactivate a possible feature

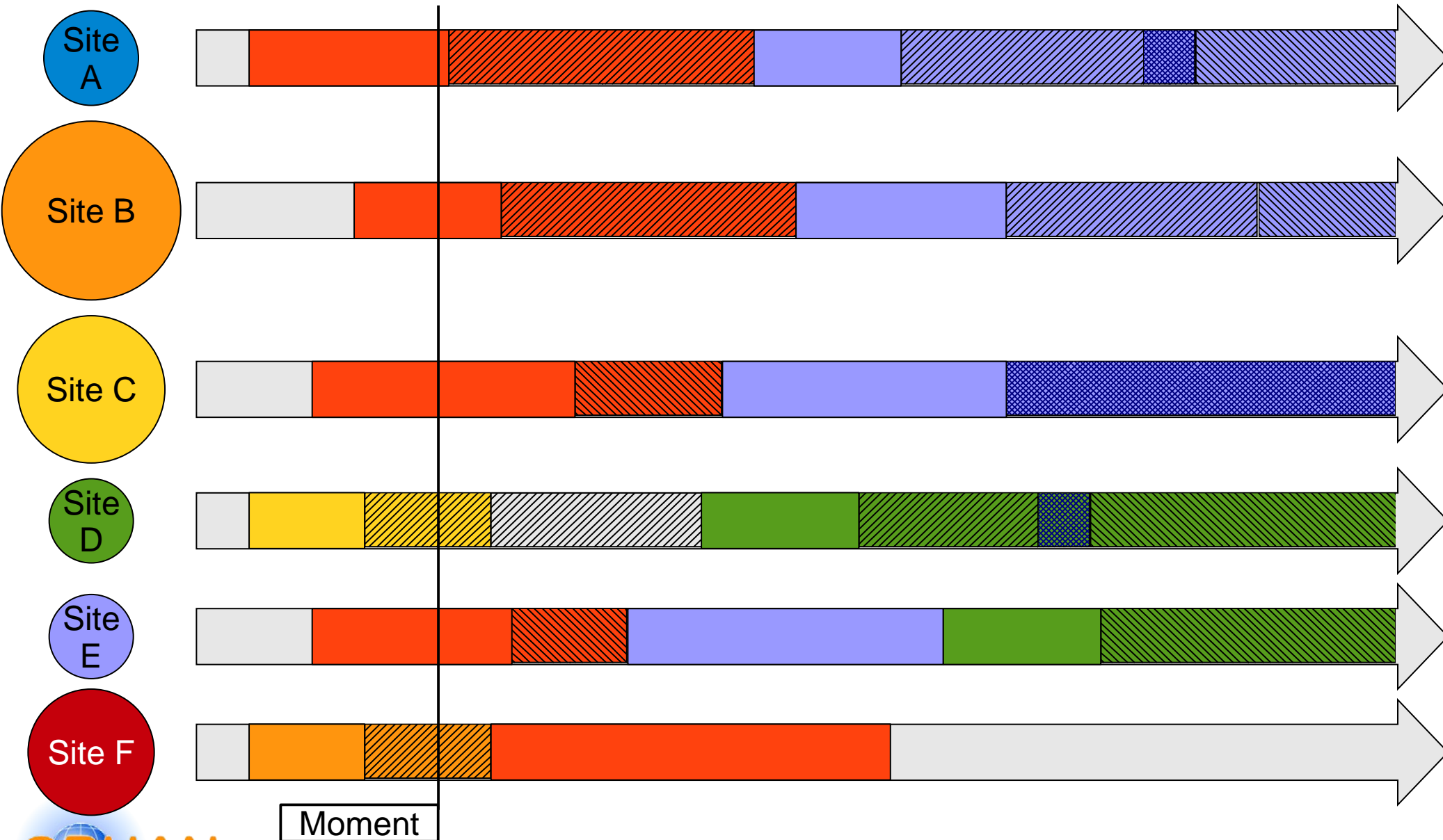
→ Change management

- Related to funding, staff and practice in the institution



Inhomogeneous network

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



Example

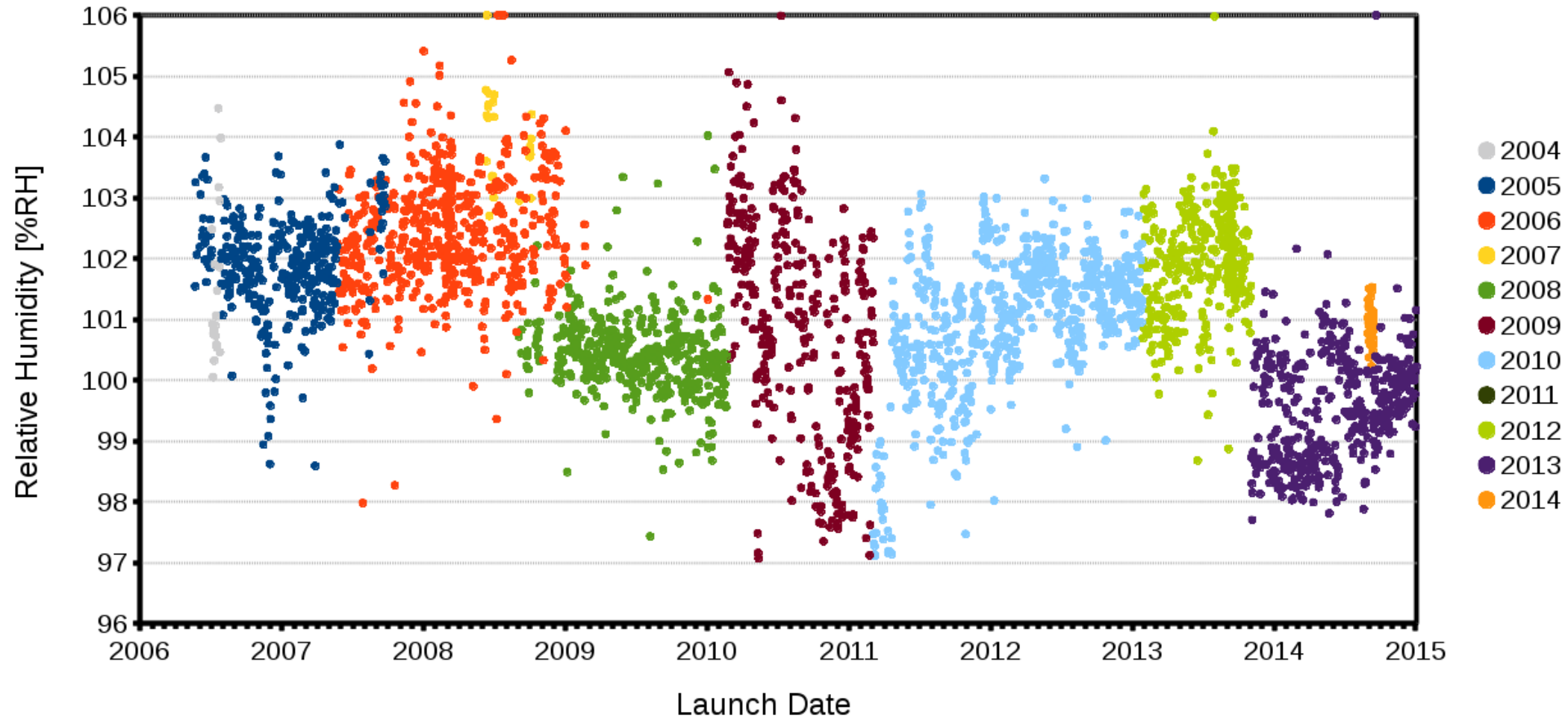
RH recalibration
using values from SHC check

SHC data series at Ny-Ålesund

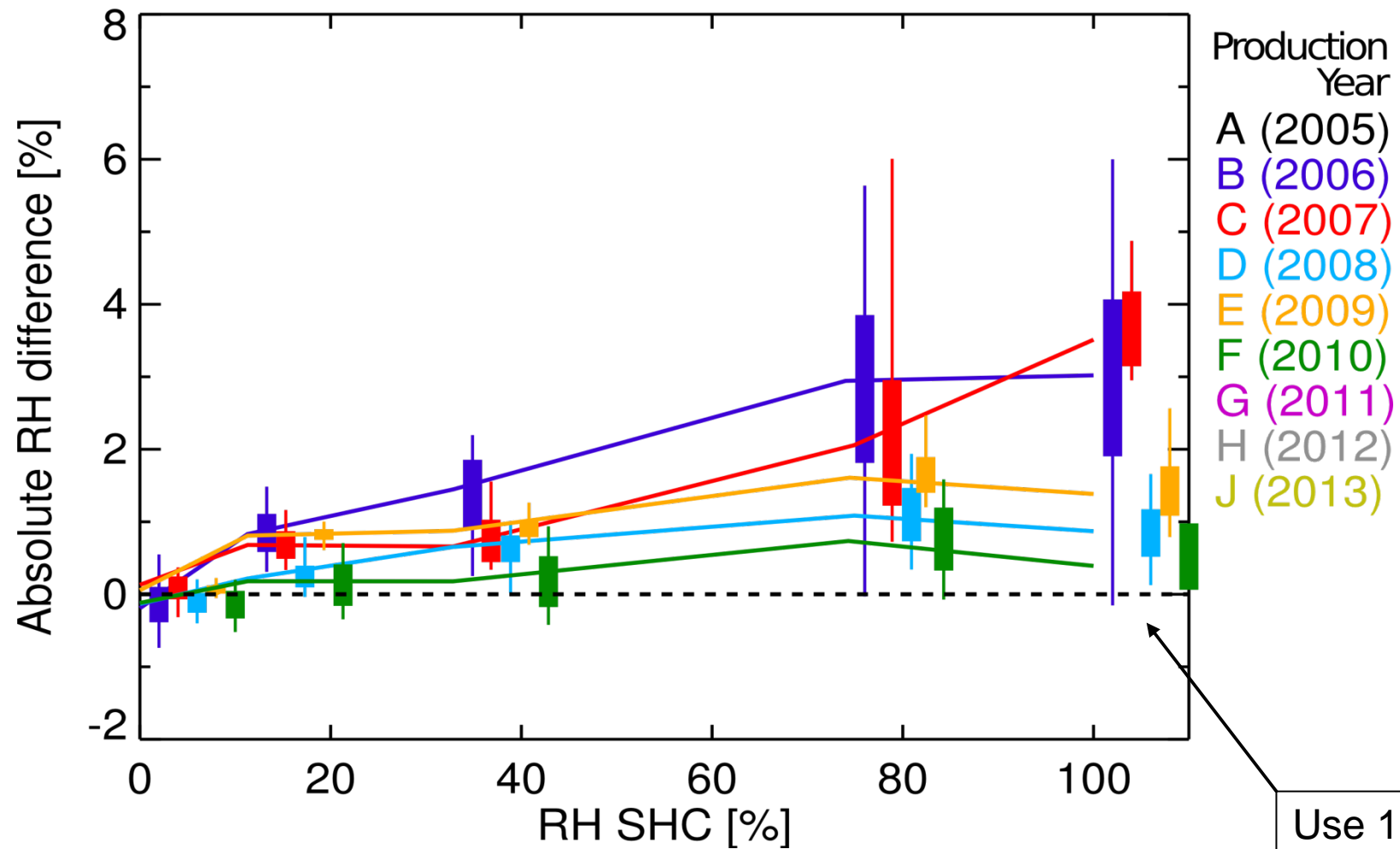
Deutscher Wetterdienst
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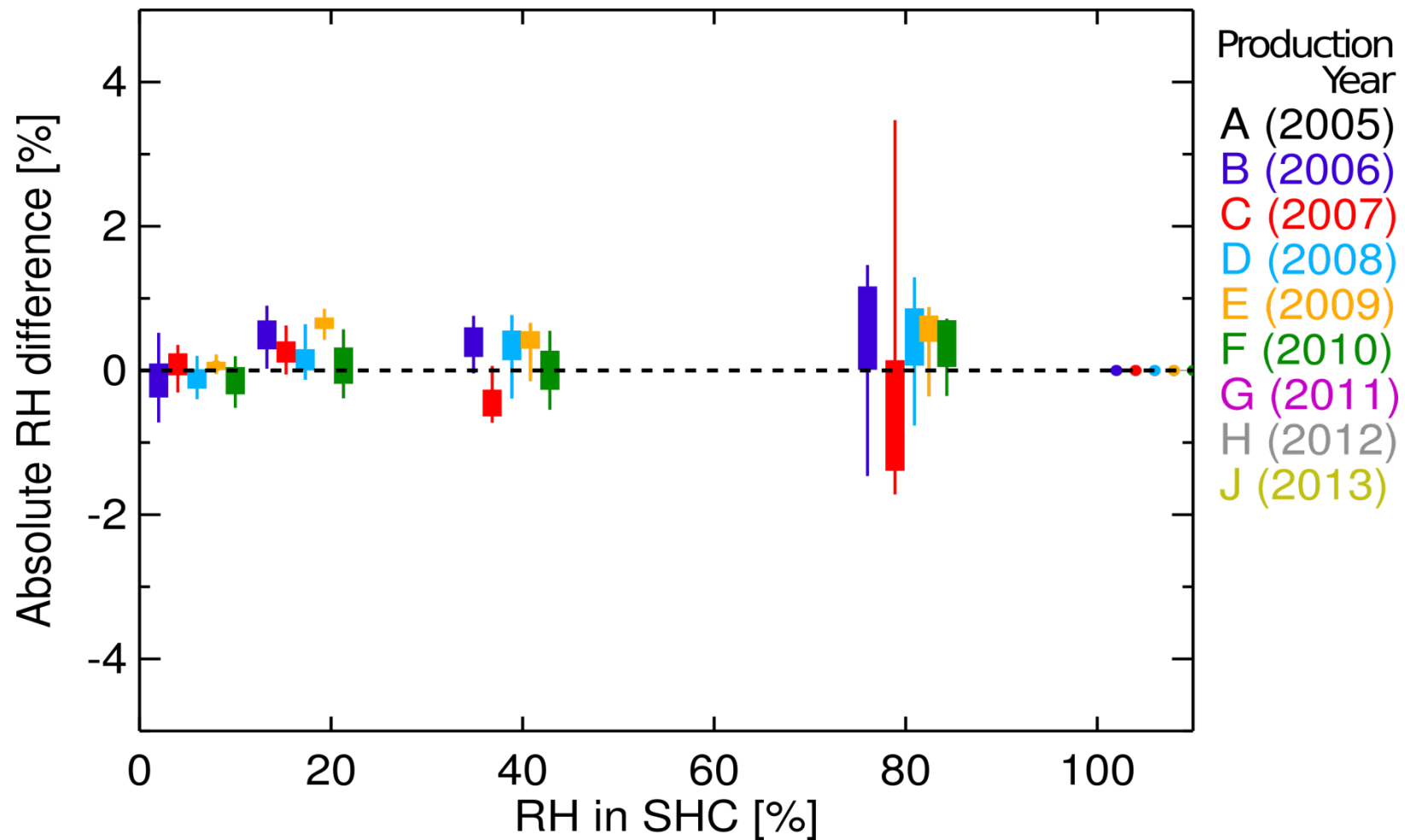
Use of Standard Humidity Chamber at 100% (2006-2014)



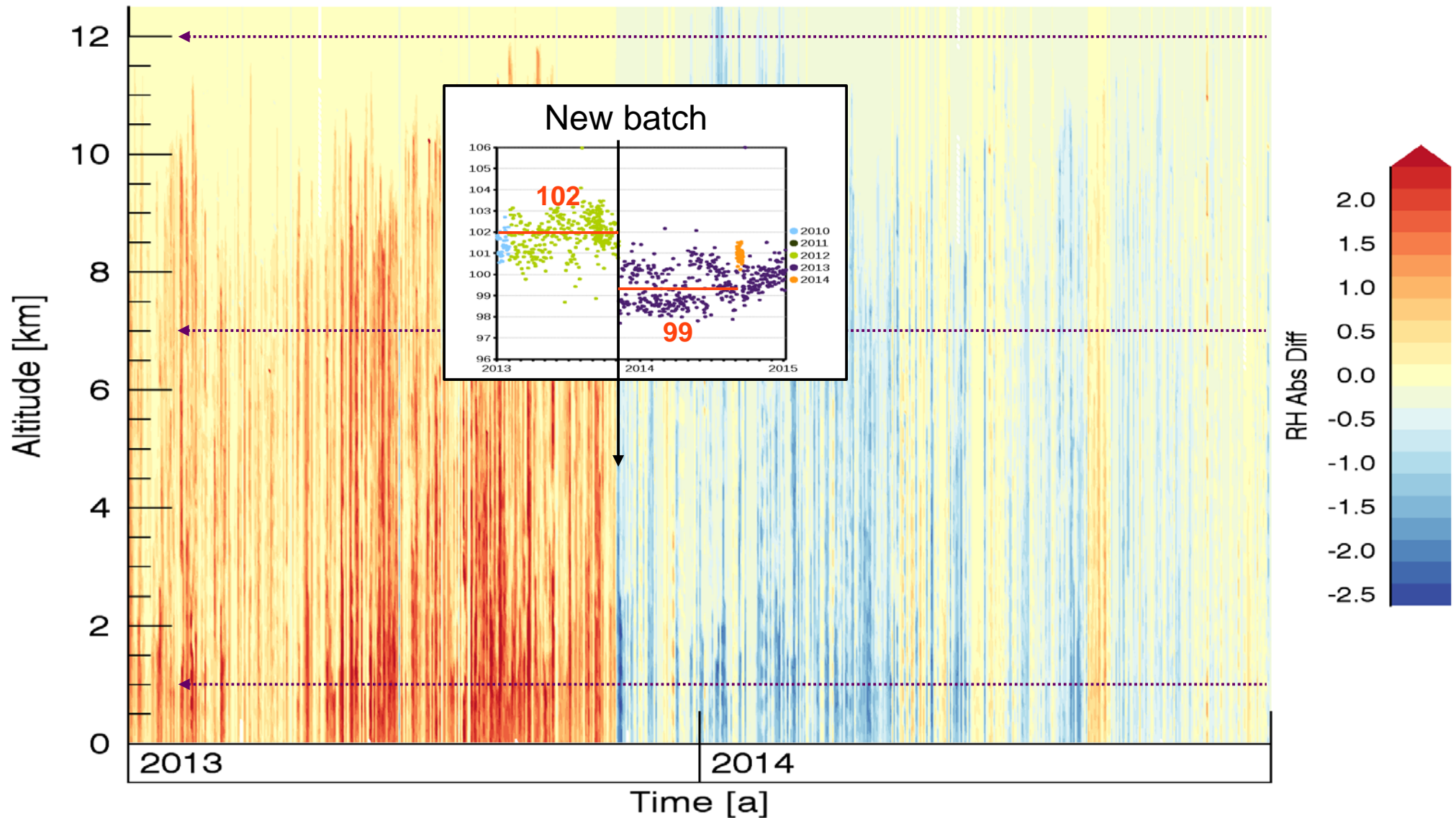
Recalibration – 1



Recalibration – 2



Difference of RS92-BETA (v015 - v016) at NYA-RS-01

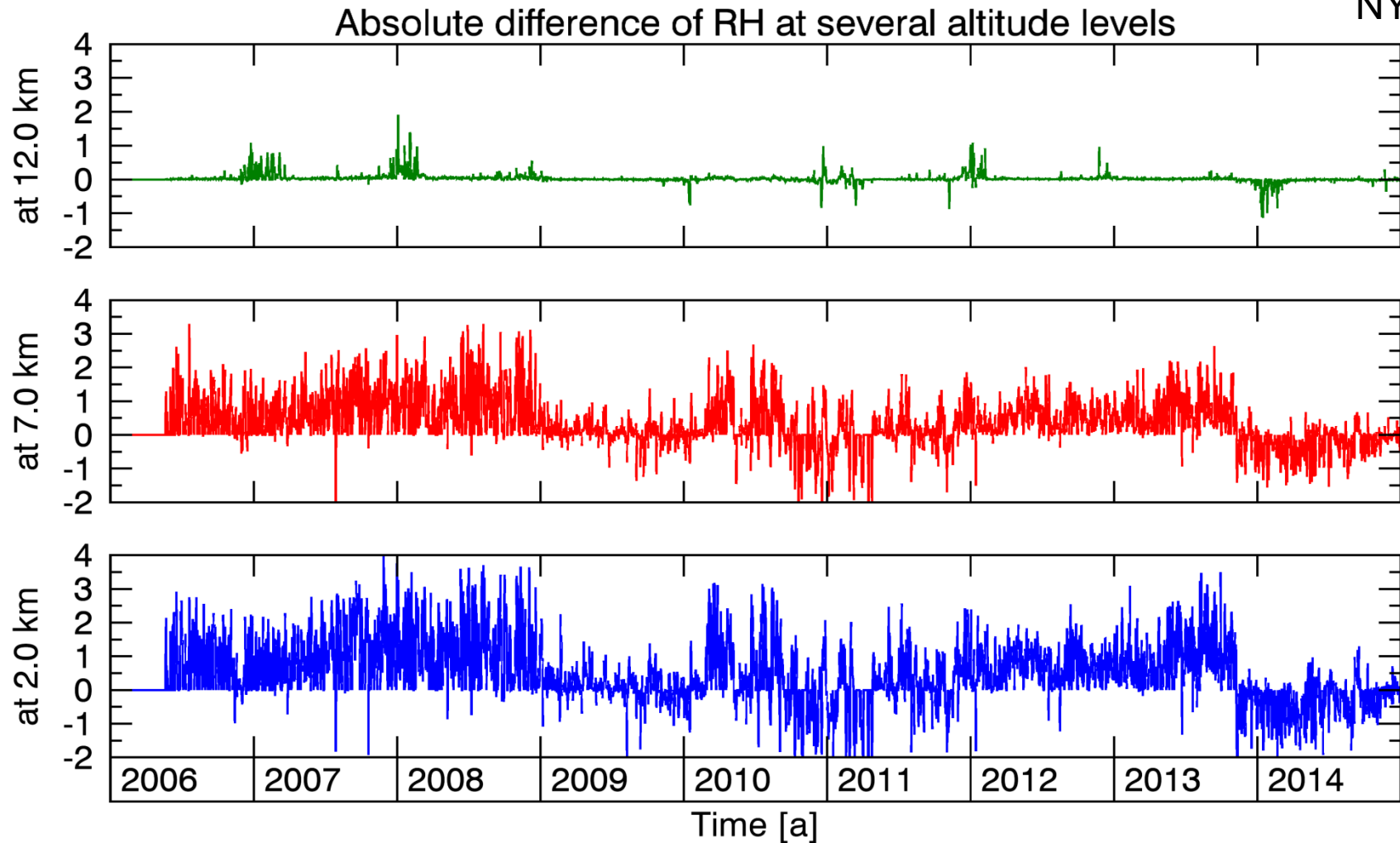


Difference at several levels

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



NYA-RS-01



→ Use of SHC recalibration

- Removing a real bias
- Best possible result for each individual measurement
- Inhomogeneous data series: without vs. with use of SHC

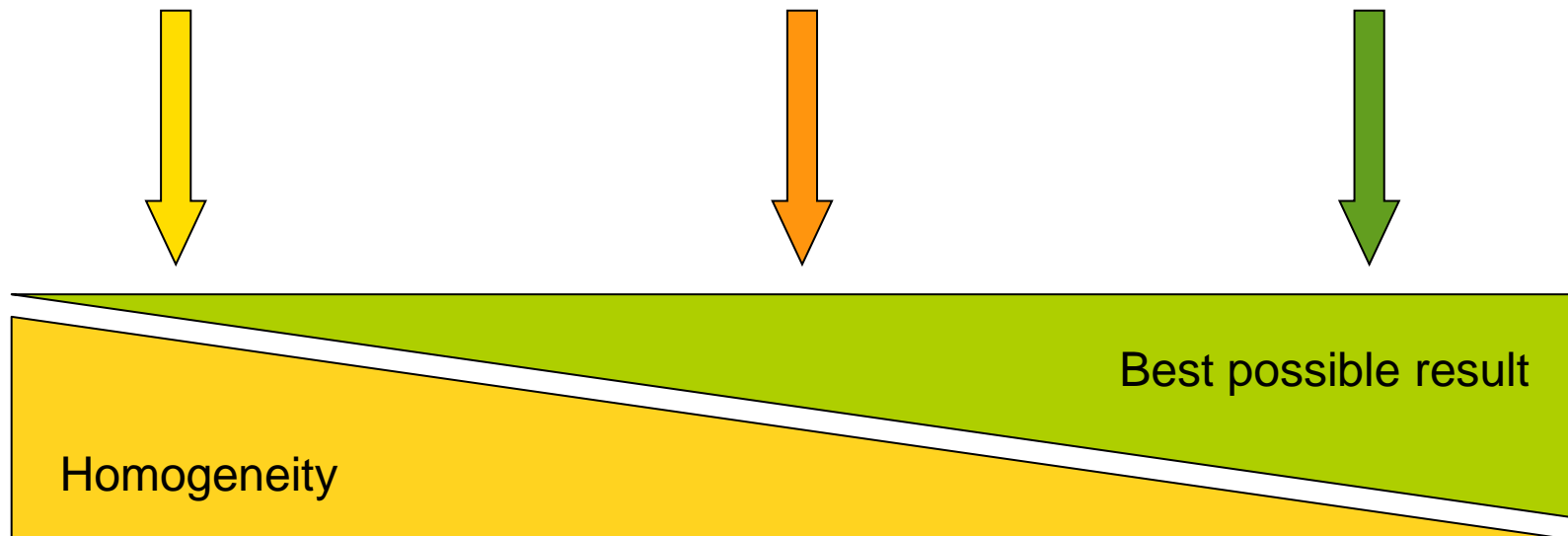
→ No use of SHC information

- Ignoring a known bias
- An issue for comparison with satellites / models

- Choose per **measurement** – *Use always the way with best possible results.*
 - inhomogeneous in time & space
- Choose per **site** – *Use one way which is available per site.*
 - inhomogeneous in space
 - but not best possible or not processable for site
- Choose per **time** – *Use one way which is available at a date for all sites.*
 - inhomogeneous in time
 - but not best possible for some sites
- Choose per **stream** – *Use one way which is always available for all sites.*
 - homogeneous (but not best possible) in time & space

→ Sorry, there is **no** distinct solution. We have to choose.

Which way do we want to go in GRUAN?



- Reality is a cross-network **inhomogeneity**.
- Best possible result and homogeneity is **not** the same.
- There is no **distinct** solution. We have to choose.

Your thoughts?