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ICM-16

TT4 - Autolaunchers

Gonzague Romanens, Giovanni Martucci, Marco Rosoldi, Fabrizio Marra, Gessica Cosimato, Ilaria GAndolfi, Miguel Hernández Martínez de la Peña, José María Rodríguez González, Natalia Prats Pta, Antoine Farah, Patrick Jann, Jason MingChun Lam, IWABUCHI Masami, AMBE Shunji , TANAKA Yuta

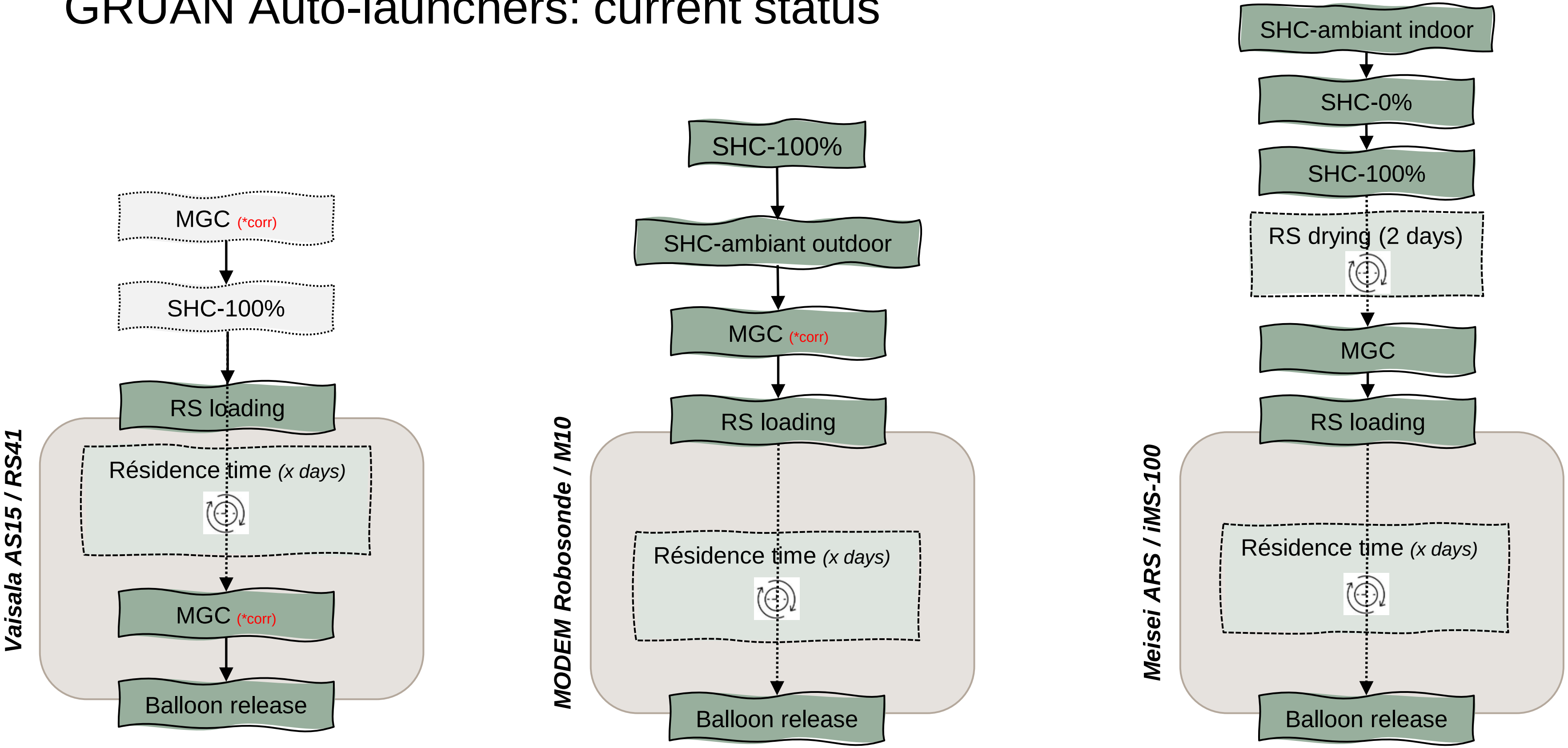
GRUAN TT4: objective and set-up

Implementation of an independent ground-check(GC) for the auto-launchers to improve measurements traceability and uncertainty quantification.

Site	Auto-Launcher type	RS type	$^*N_{\mathrm{RS}_{t_7}}$	$^*N_{\mathrm{RS}_{t_{14}}}$
Payerne (PAY)	AS15	RS41-SG	30 (30)	30 (30)
Potenza (POT)	AS15	RS41-SG	30 (30)	30 (30)
Tenerife (TEN)	AS15	RS41-SG	30 (30)	30 (30)
Hong-kong (HKO)	AS15	RS41-SG	20 (20)	20 (20)
Tateno (TAT)	ARS	iMS-100	32 (32)	32 (32)
Reunion Island (REU)	Robosonde	M10	30 (3)	30 (15)
Modem Headquarter (URY)	Robosonde	M10	30 (30)	29 (29)

* Values in parentheses indicate the total number of processed RS that passed the complete MGC and SHC steps at t_0, t_7, t_{14}

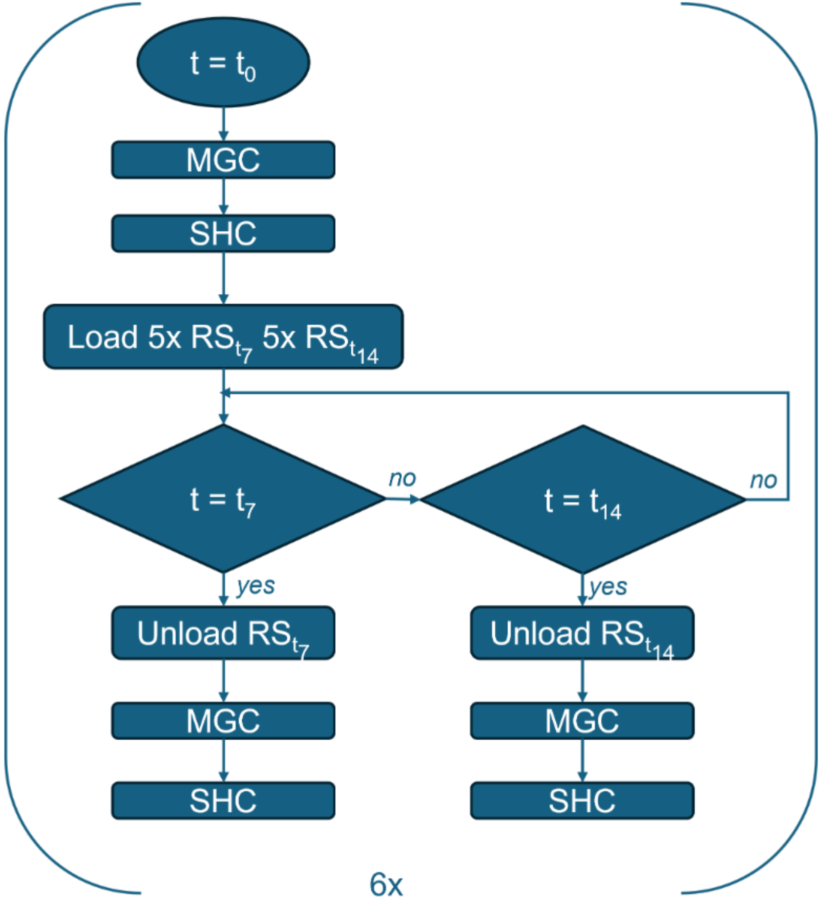
GRUAN Auto-launchers: current status



TT4 experiment: Methodology

- Harmonized SHC procedure, well documented.
- Can we quantify the impact of RS residence time into the auto-launcher on the SHC test?
- Is a SHC test performed at loading time (t_0) still representative for t_7, t_{14}?

<u>Target (for each sites):</u>
30# $t_0 - t_7$
30# $t_0 - t_{14}$



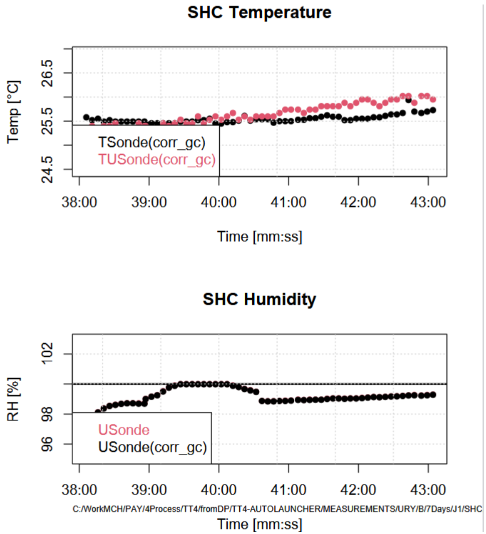
TT4 experiment:

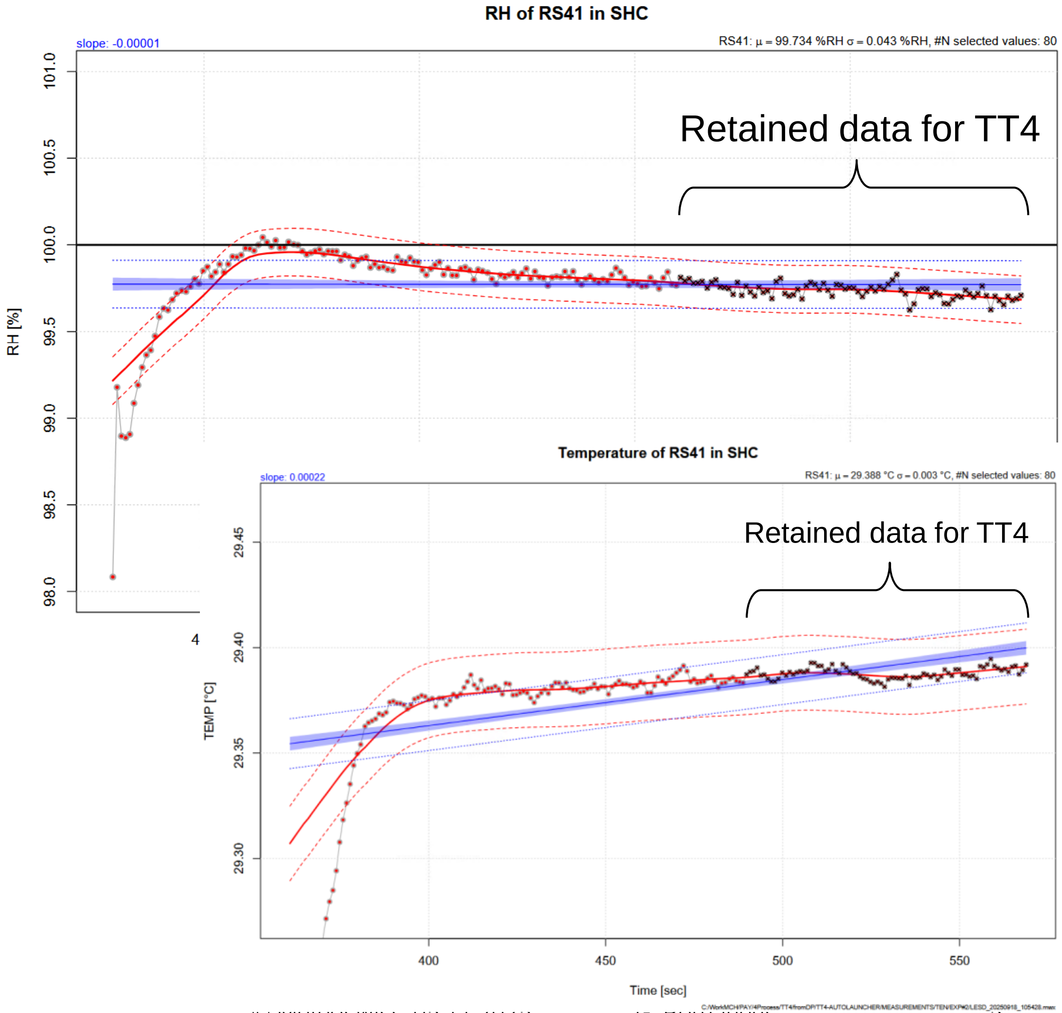
workflow

- Use the dp.gruan.info as repository
- Near realtime processing
- Feedback & analysis to sites

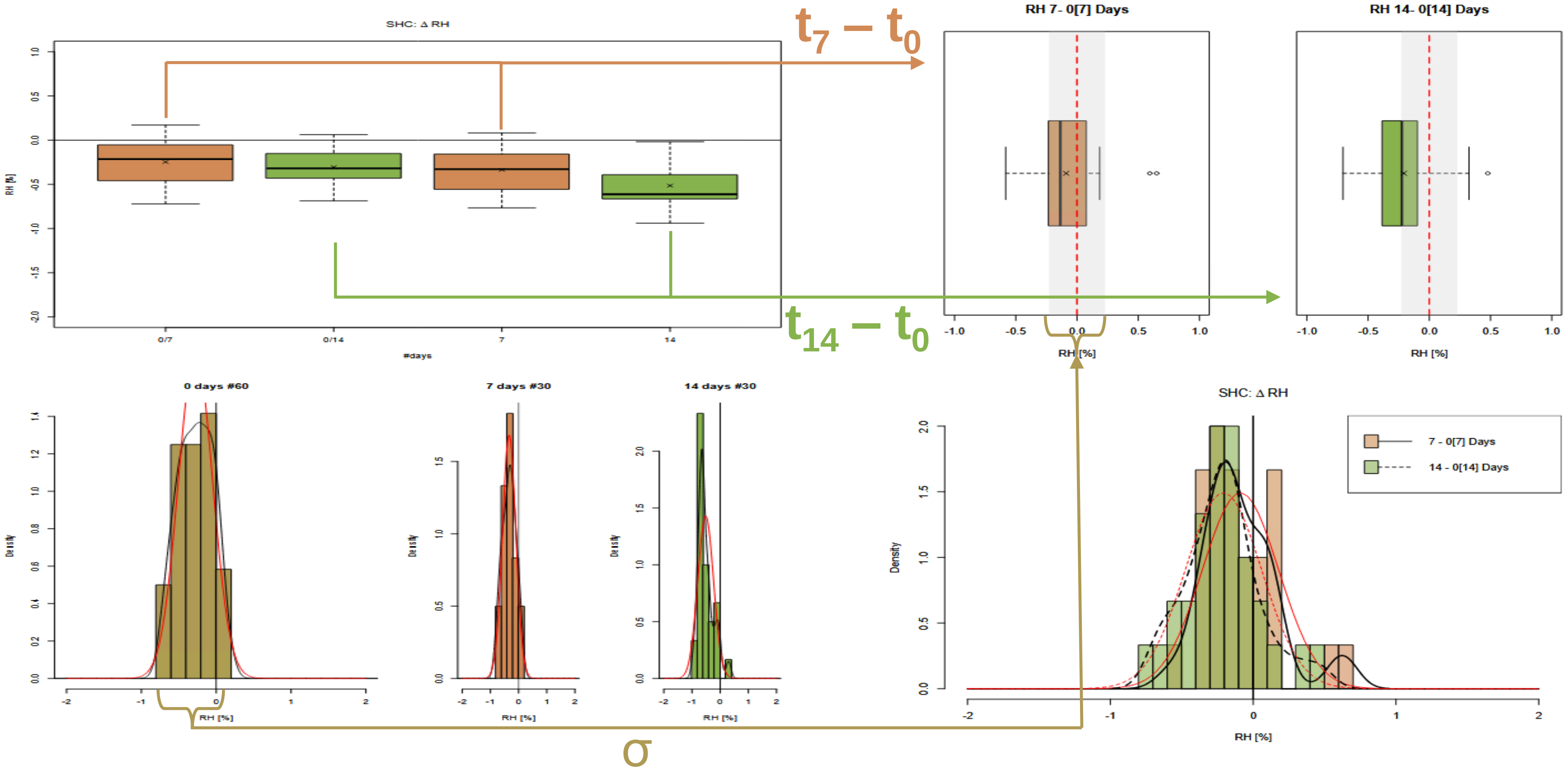
Dataset preparation

- Vaisala harmonized SHC data filtering and selection

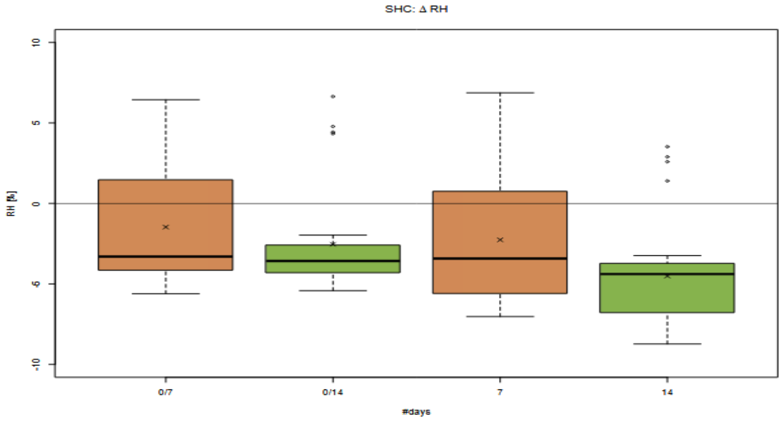


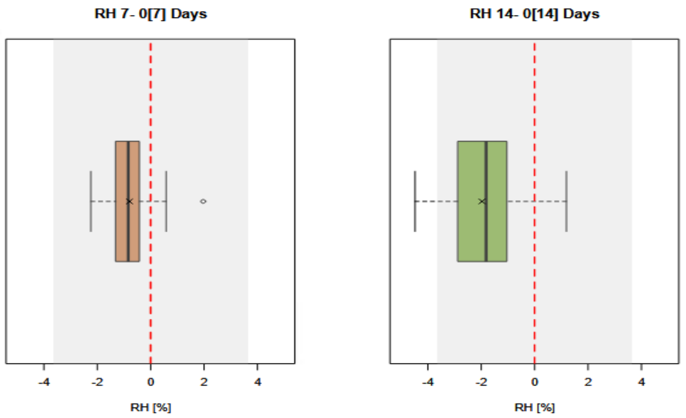


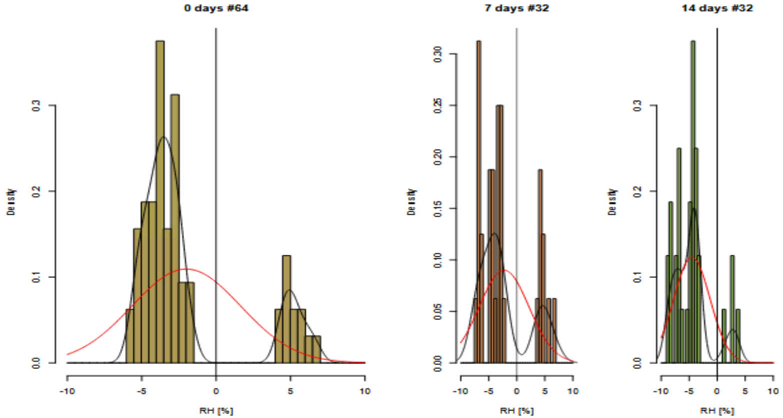
TT4 experiment: analysis of POT SHC data

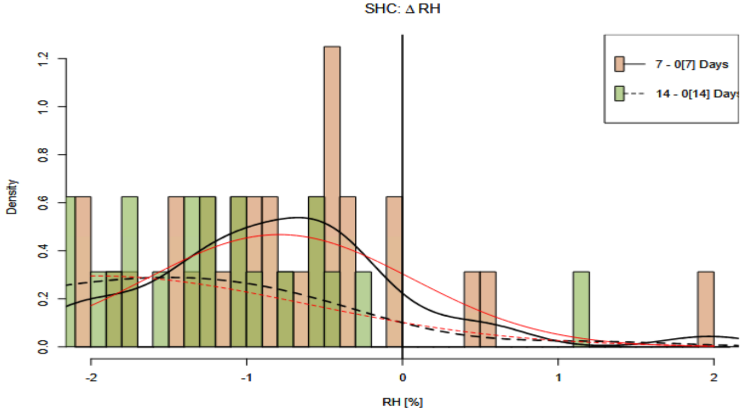


TT4 experiment: all year analysis of TAT SHC data

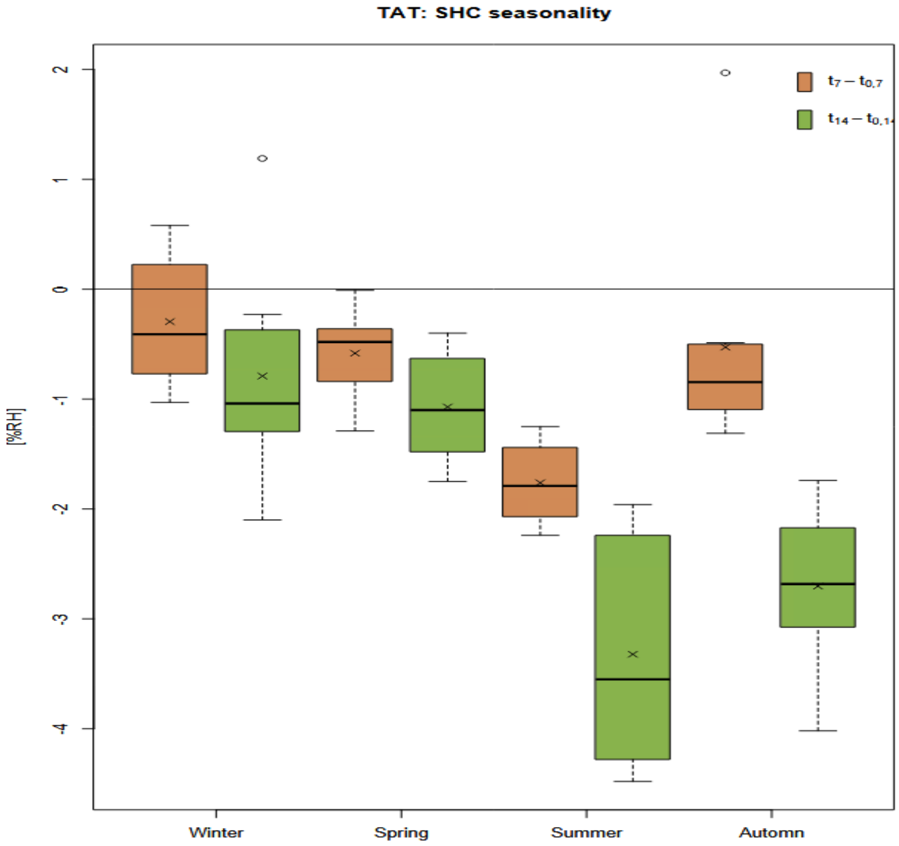




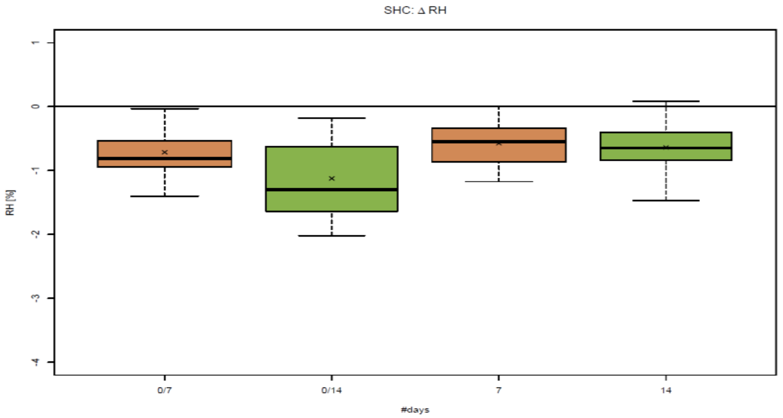


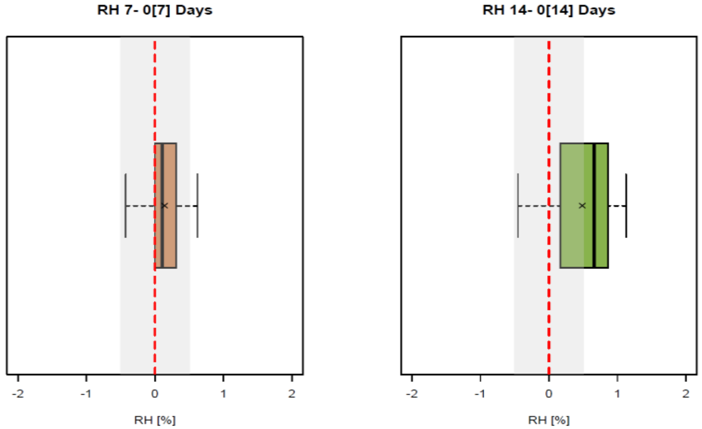


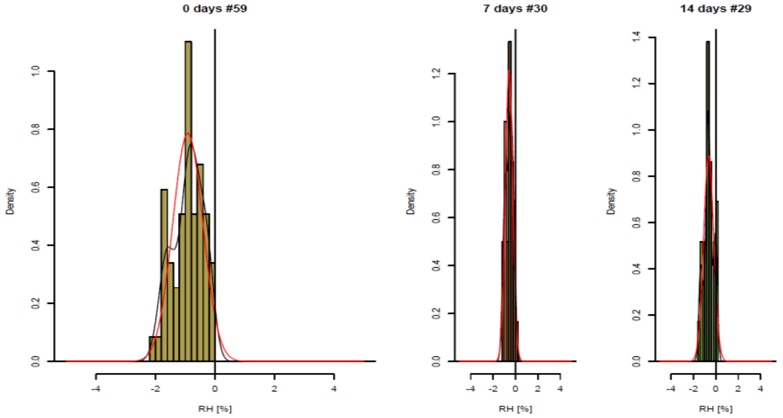
TT4 experiment: seasonal analysis of TAT SHC data

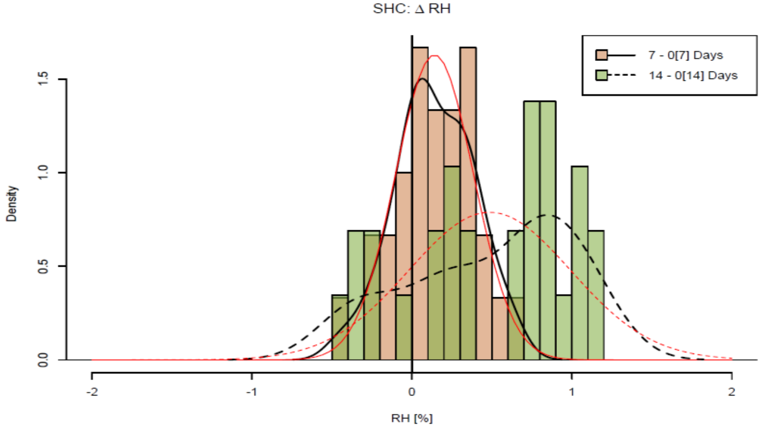


TT4 experiment: analysis (URY)

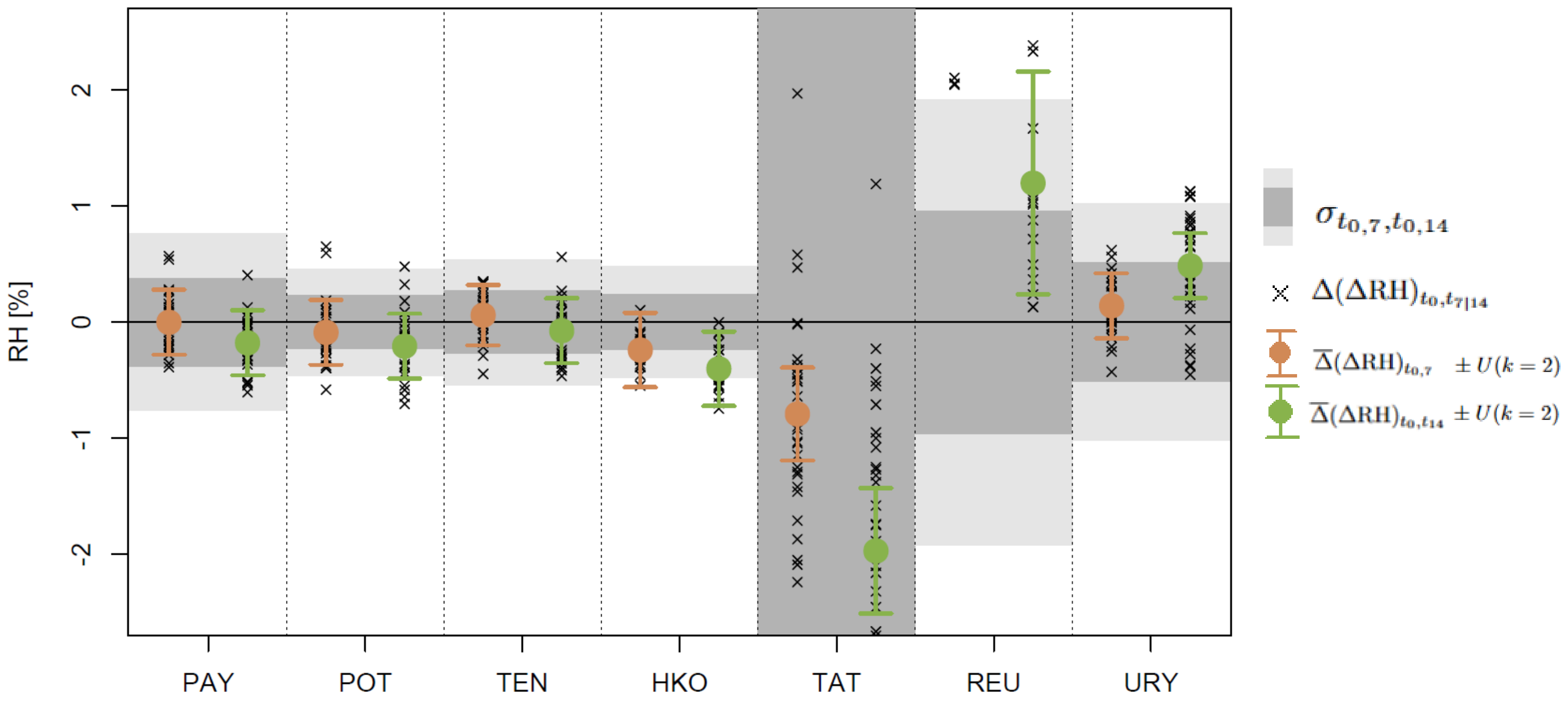








TT4: summary of statistical results:



TT4 experiment: recommendations

1. $t > 14$ days: Radiosondes stored for more than 14 days **shall not be considered GRUAN-compliant** and must not be used for GRUAN soundings.
2. $7 < t \leq 14$ days: Radiosondes stored between 7 and 14 days are **acceptable** for GRUAN operations. No statistically significant RH bias was observed across the tested systems within this interval.
3. $t \leq 7$ days: Radiosondes stored for less than 7 days represent the **optimal operational range**, ensuring the highest confidence in humidity sensor stability and the representativeness of the SHC.

Afterthought:
Understanding the impact of Vaisala MGC at 0% on the measurement at 100%.

Future work:
Understanding the impact of RS resident time inside the auto-launcher on the final GRUAN uncertainty budget.

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MeteoSwiss
Operation Center 1
CH-8058 Zurich-Airport
T +41 58 460 91 11
www.meteoswiss.ch

MeteoSvizzera
Via ai Monti 146
CH-6605 Locarno-Monti
T +41 58 460 92 22
www.meteosvizzera.ch

MétéoSuisse
7bis, av. de la Paix
CH-1211 Genève 2
T +41 58 460 98 88
www.meteosuisse.ch

MétéoSuisse
Chemin de l'Aérologie
CH-1530 Payerne
T +41 58 460 94 44
www.meteosuisse.ch

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