

# ALARO EXPERIENCE AT IPMA

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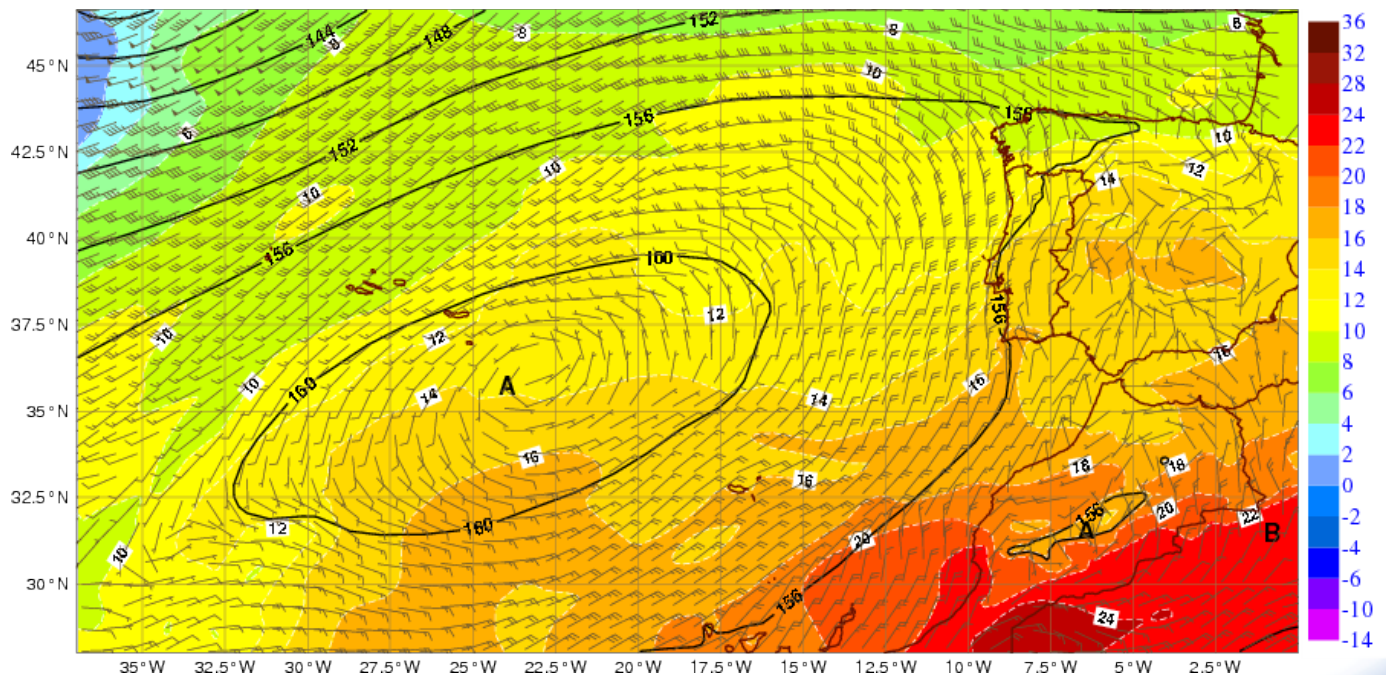
12-14 May 2014

# Overview

- Setup used in the two experiments with ALARO
- Sample of the verification results
- Final remarks

# Phase 1 – 2009/10

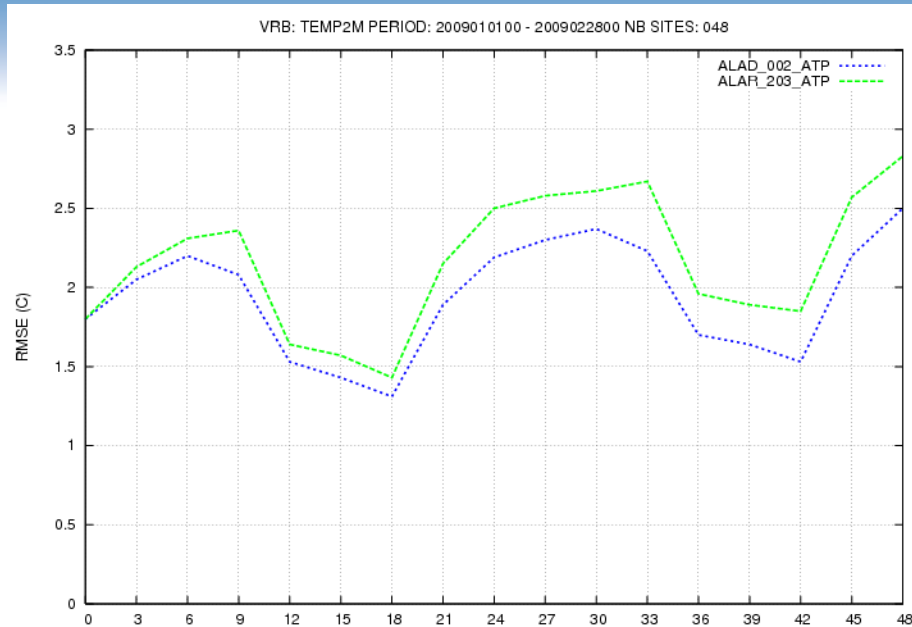
- ALARO CY35T1 available Jan 2009 – Summer 2010
- Horizontal Resolution: 9 km ; 1 Domain (ATP)



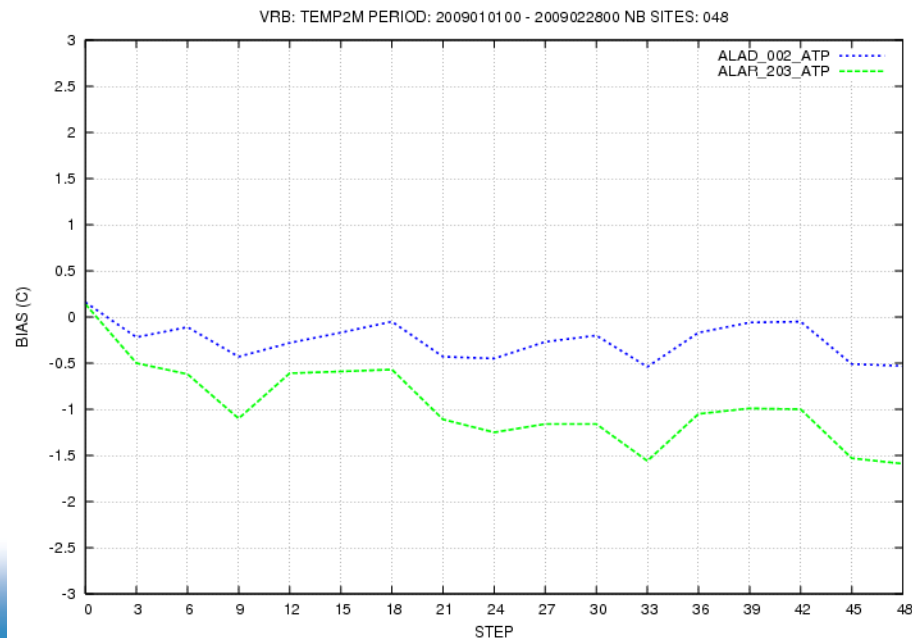
# Phase 1 – Verification (1)

## RMSE

- Temperature 2m
- Winter 2009

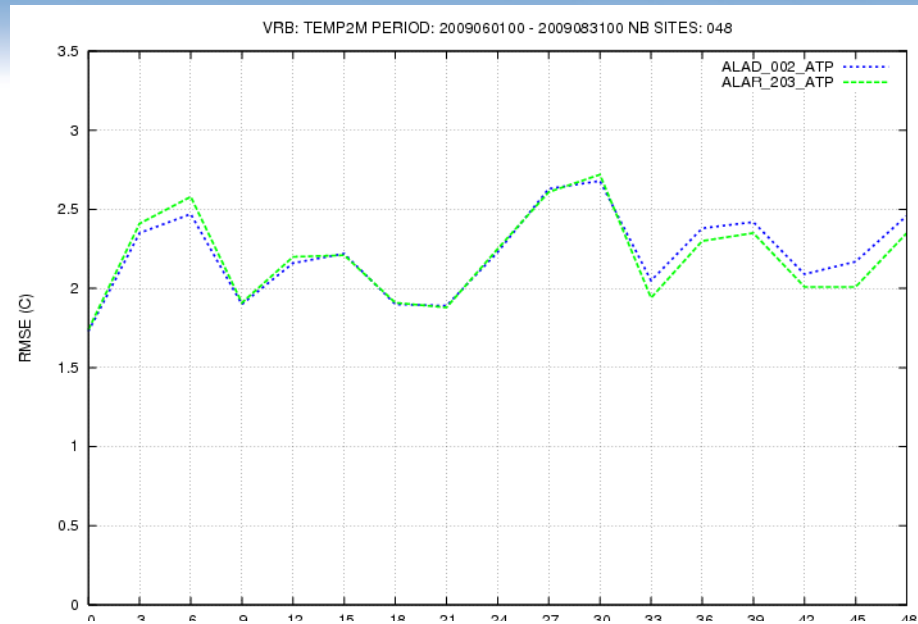


## BIAS



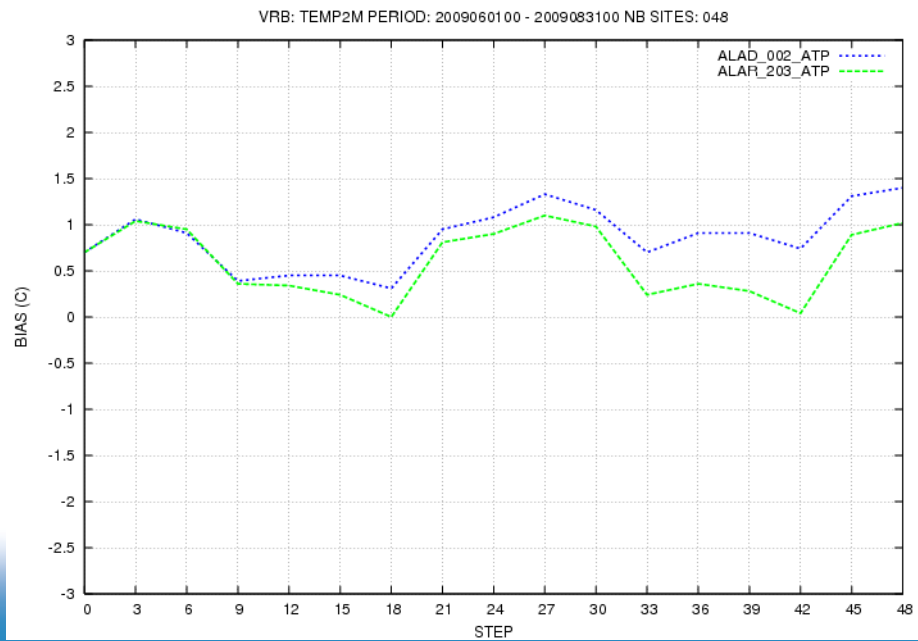
# Phase 1 – Verification (2)

## RMSE



- Temperature 2m
- Summer 2009

## BIAS

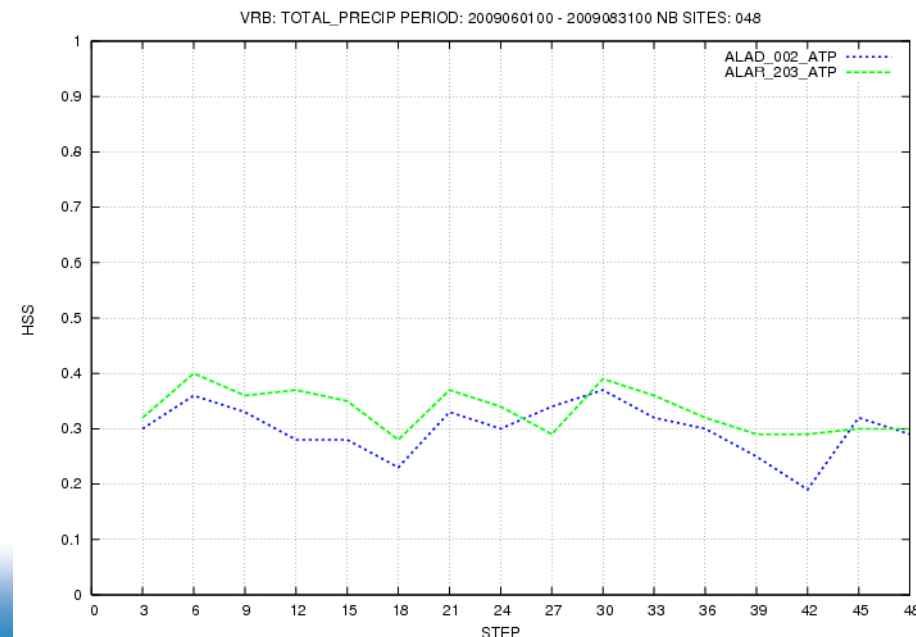
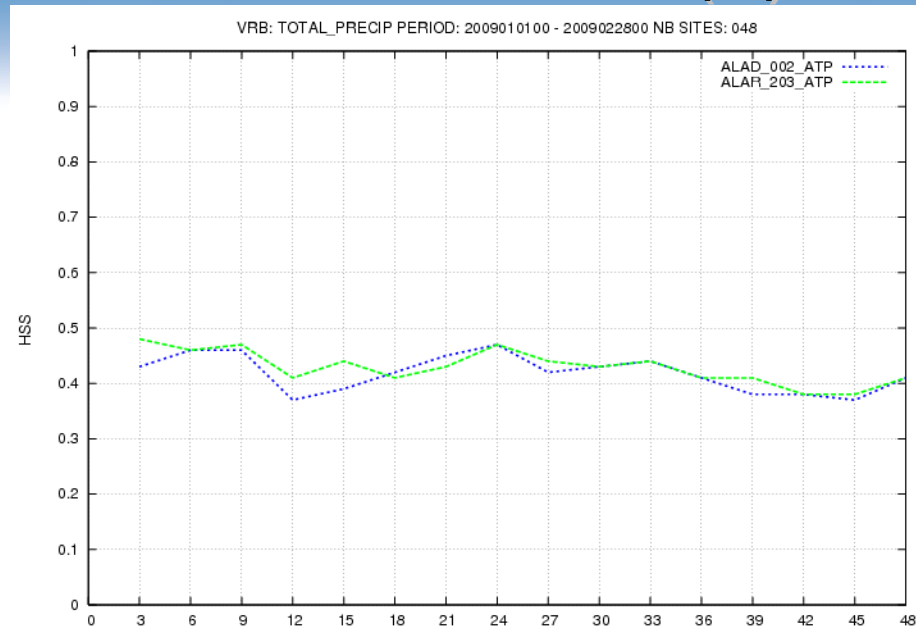


# Phase 1 – Verification (3)

Winter

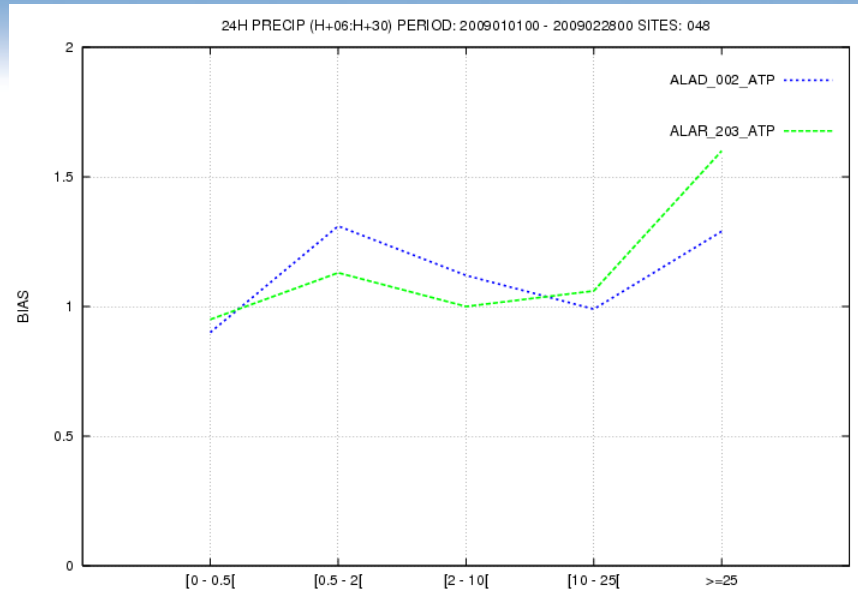
- 3h Precipitation
- HSS

Summer



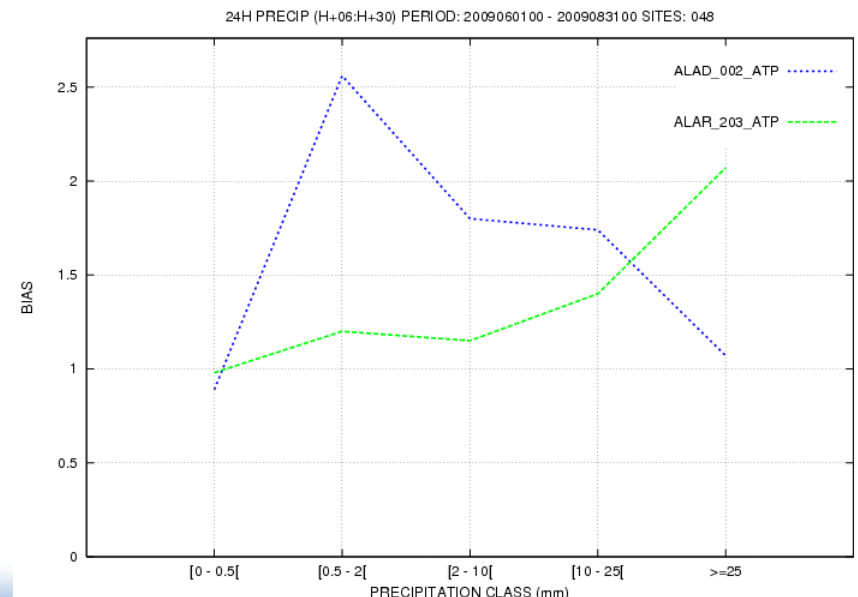
# Phase 1 – Verification (4)

Winter



- 24h Precipitation
- Bias

Summer



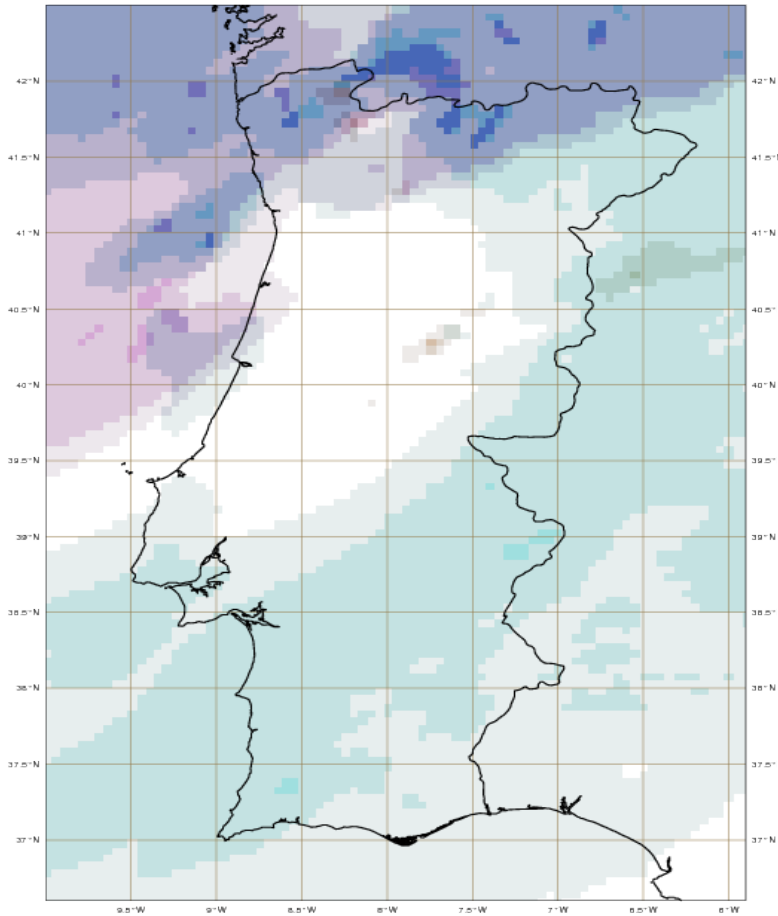
## Phase 2 – 2010/12

- CY36T1 installed in late 2010
- ALARO forecasts available in 2009-2012
- Horizontal Resolution: 5 km
- Domains: 2



# Phase 2 - Domains

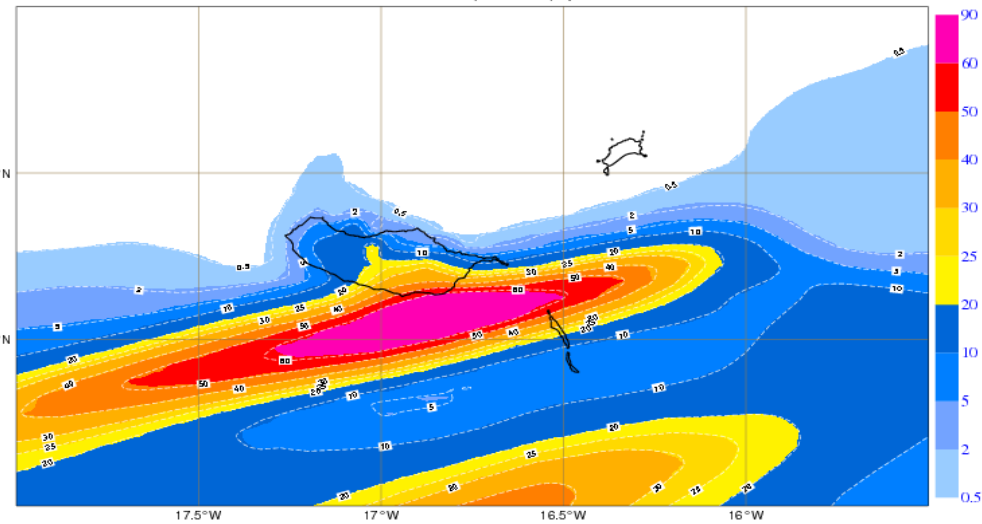
ALARO\_PTG: Nuvens Baixas B+M Medias M+A Altas A+B A+M+B  
 06-06-12 00 UTC Previsão H+18 para 06-06-12 18 UTC



## Mainland

## Madeira Islands

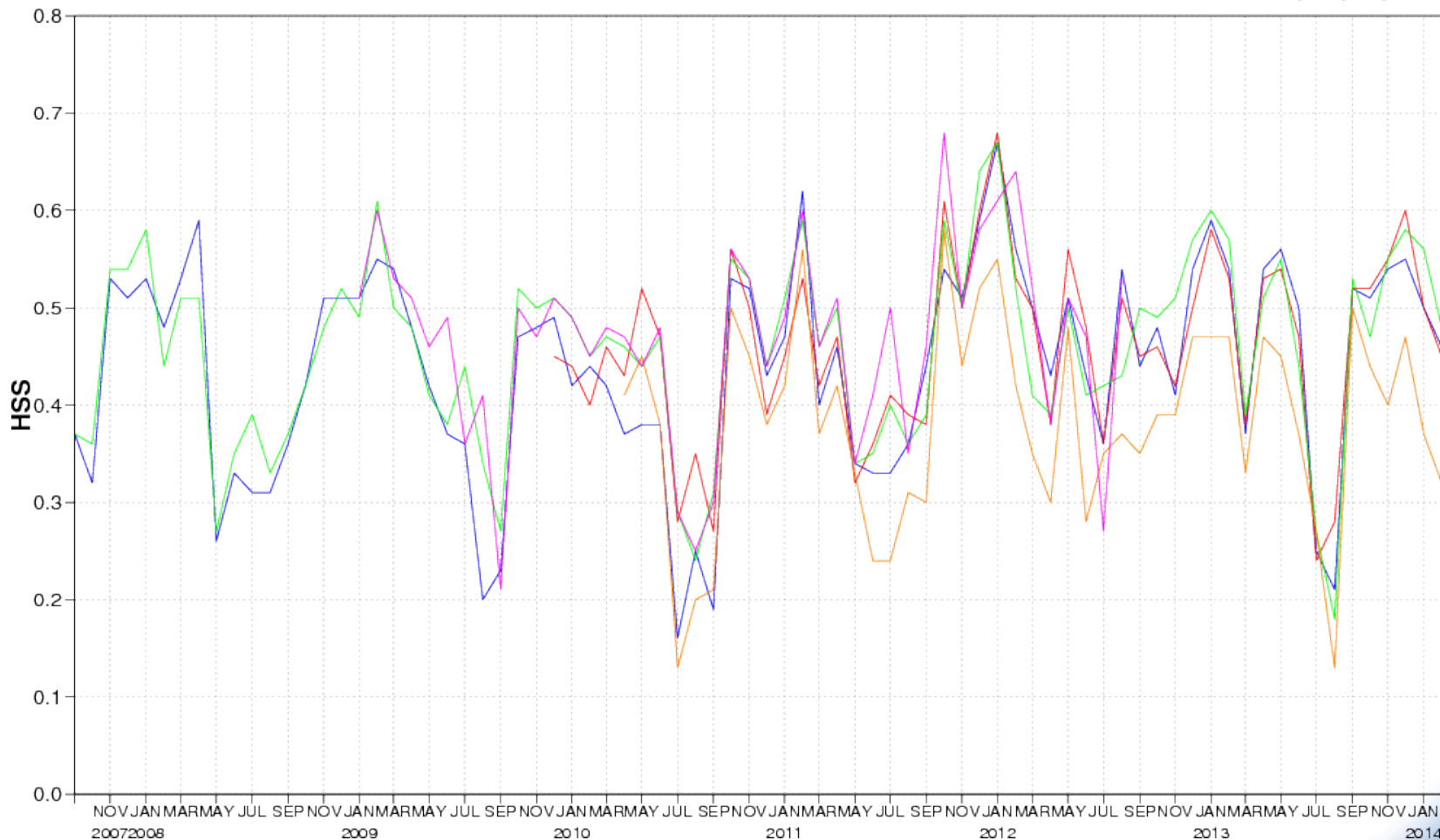
ALARO\_MAD: Precipitação total (mm) acumulada em 3 horas  
 Wed 23 Dec 09 00UTC Previsão H+(12-09) para Wed 23 Dec 09 12UTC



# Phase 2: 24h precipitation

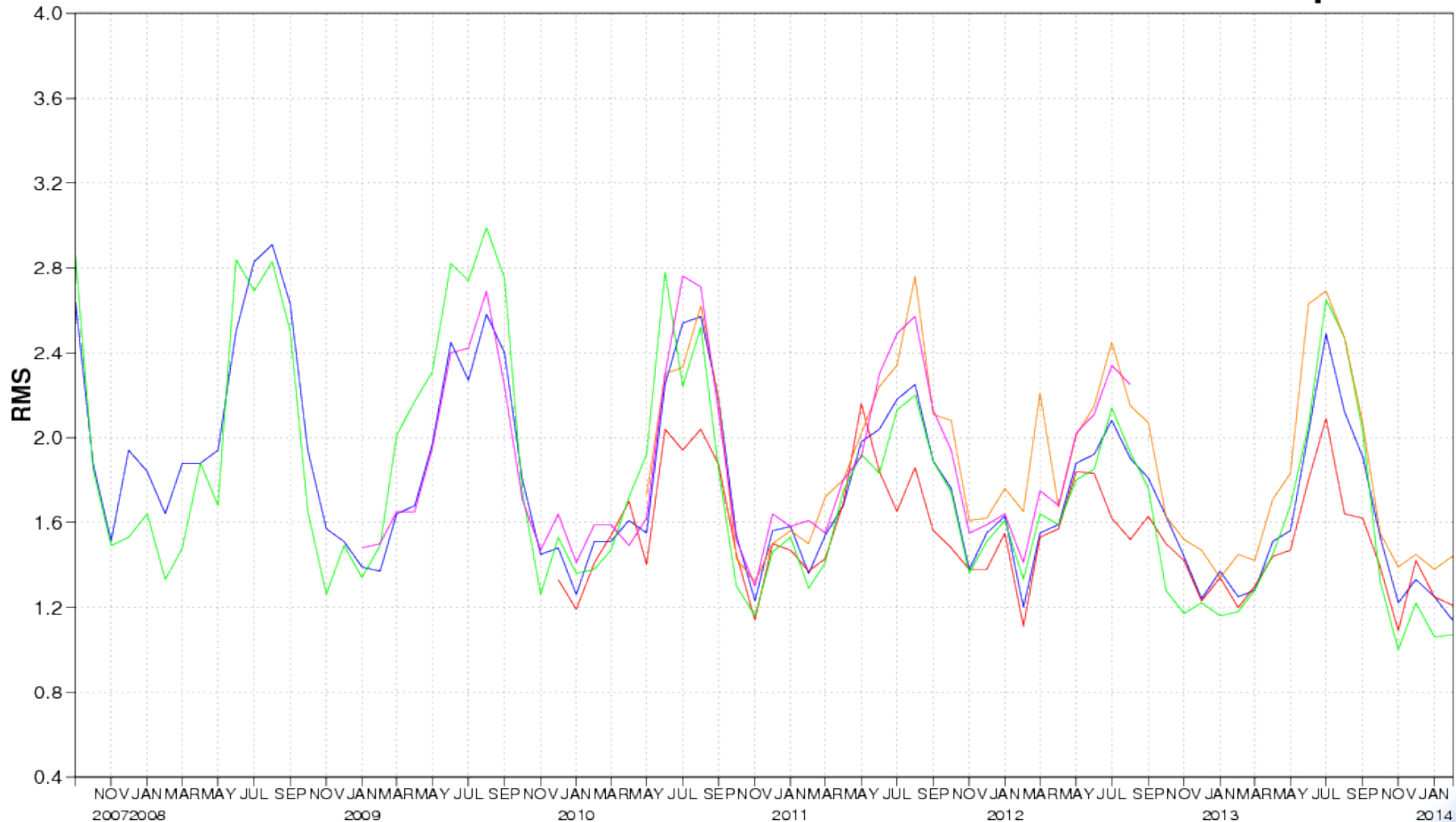
**Score: HSS Variável: Precipitacao acumulada em 24 horas (mm) Tolerancia: na Estacoes:48**

**Modelos: ECMWF ALADIN AROME HIRLAM ALARO Run: 00 UTC Período: H+06/H+30**



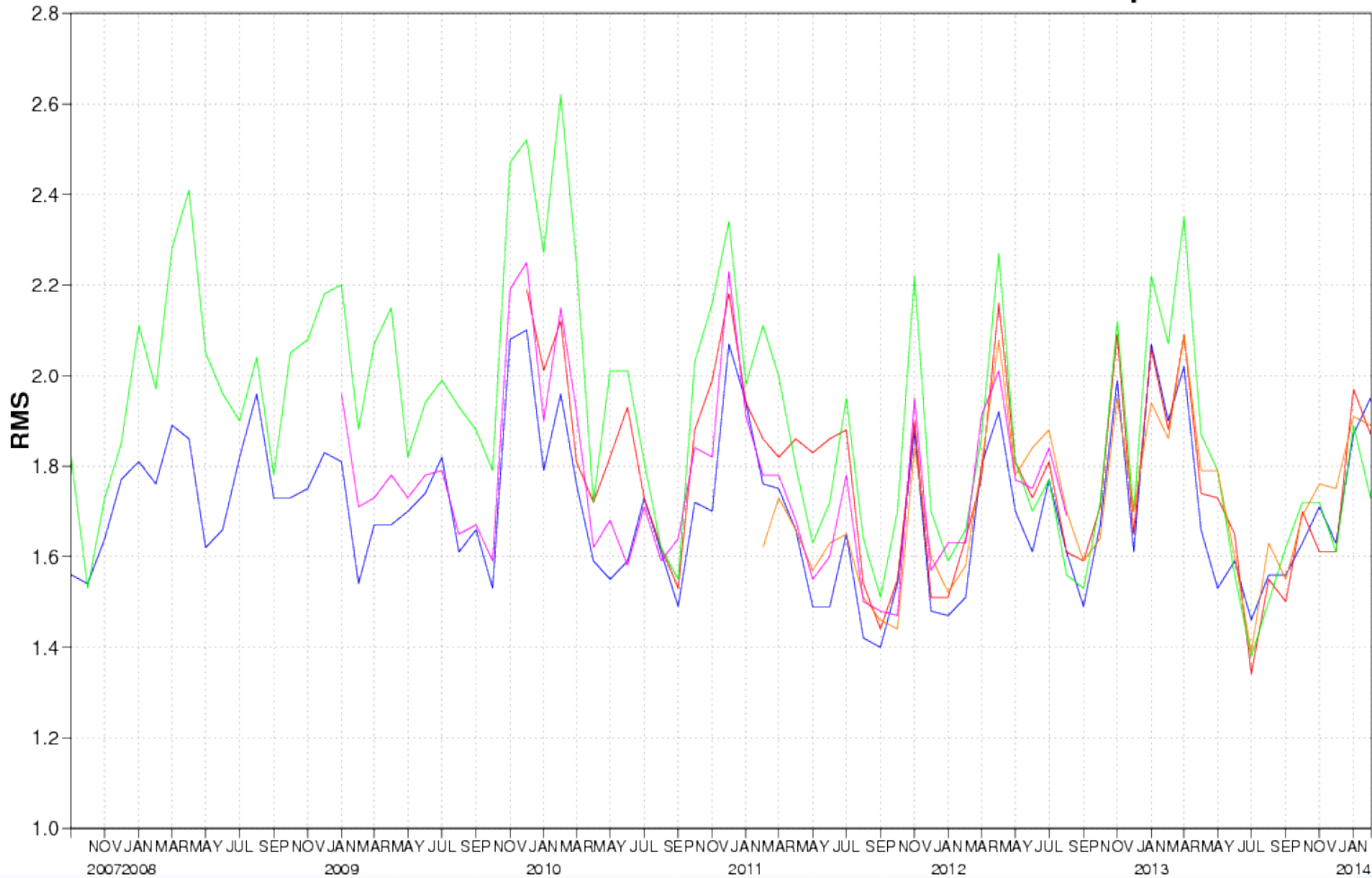
# Phase 2: 2m Temperature

**Score: RMS Variavel: Temperatura a 2m (°C) Tolerancia: na Estacoes:21**  
**Modelos: ECMWF ALADIN AROME HIRLAM ALARO Run: 00 UTC Step: H+15**



# Phase 2: 10m Wind Speed

**Score: RMS Variavel: Intensidade do vento a 10m (m/s) Tolerancia: na Estacoes:21**  
**Modelos: ECMWF ALADIN AROME HIRLAM ALARO Run: 00 UTC Step: H+15**



# Final Remarks

- **Overall, the experience with ALARO suggests that:**
  - a) precipitation forecasts had usually one of the highest scores;
  - b) in extreme cases (e.g. rapid cyclogenesis), wind speed and gusts at 10 m performed better than ALADIN;
  - c) Some issues [cold bias] with the 2 m temperature
- **With the acquisition of a new HPC, the operational system [domains, resolutions, model setup] is under review.**