Validation of MAR over Dome C

(Hubert Gallée and Christophe Genthon,
LGGE,CNRS)

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Description of MAR

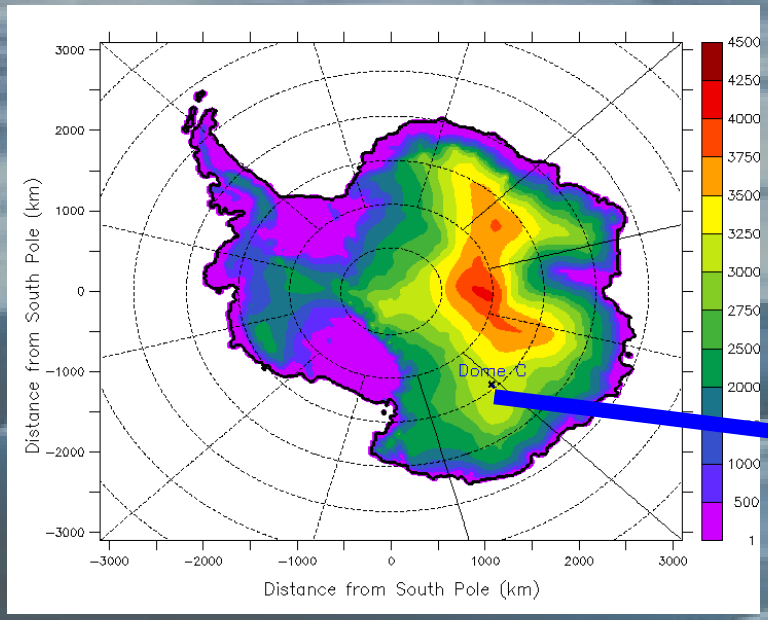
Primitive Equations Model, hydrostatic
Vertical coordinate: normalized pressure σ

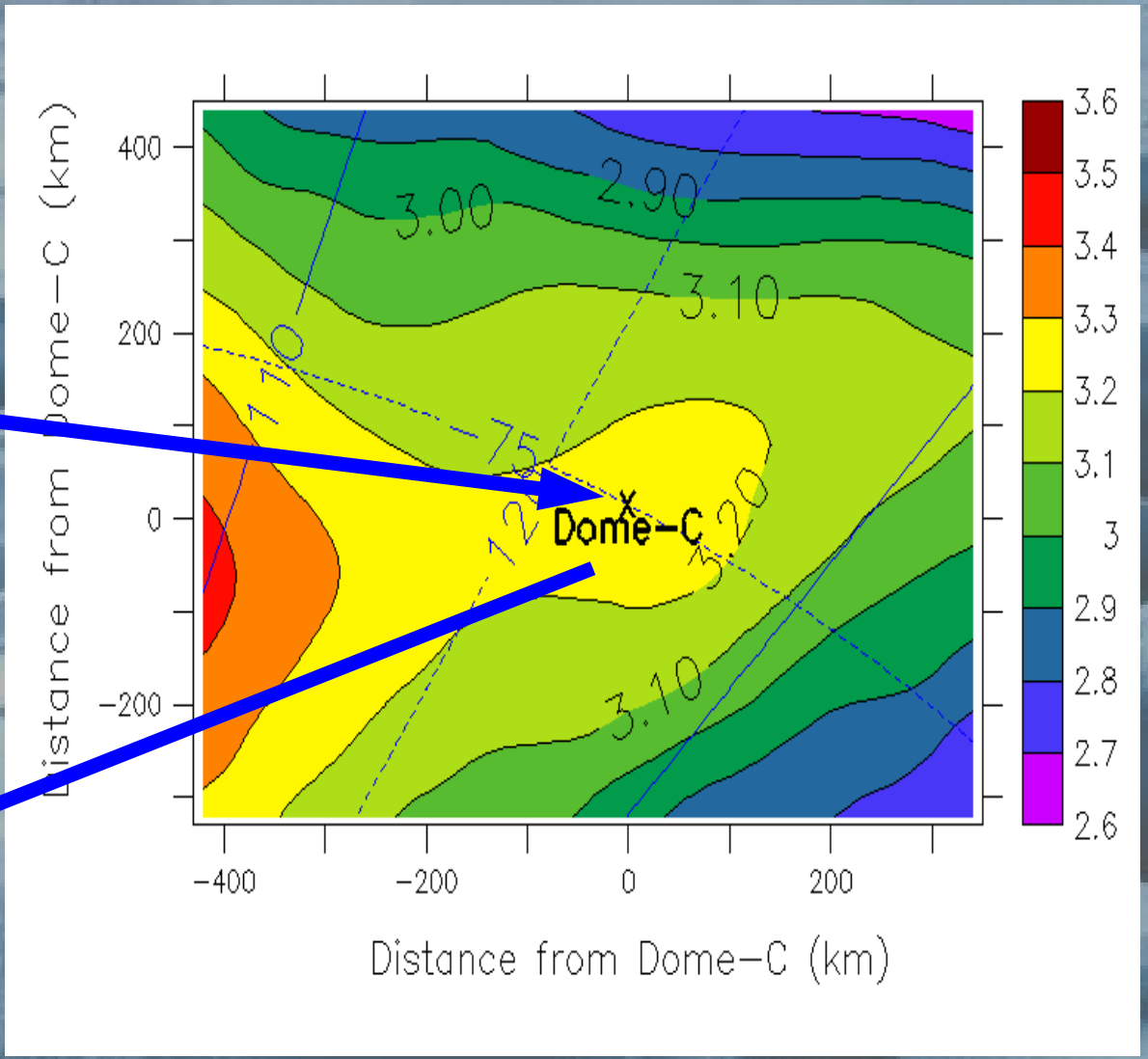
Cloud microphysics: conservation equations for
ice crystals (concentration and number),
cloud droplets,
snow flakes,
rain drops

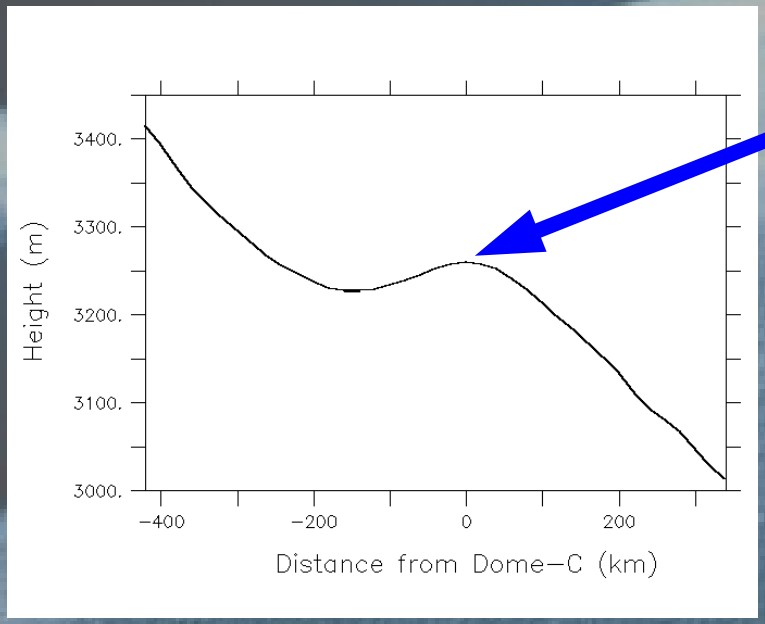
Turbulence: K - ε model (Bintanja)
SBL: Monin Obukhov similarity theory

Surface: SISVAT
(Soil Ice Snow Vegetation Atmosphere Transfert)

Dome C Domain







dx = 20 km,
60 levels, z_{SBL} = 2 m

MAR over Dome C

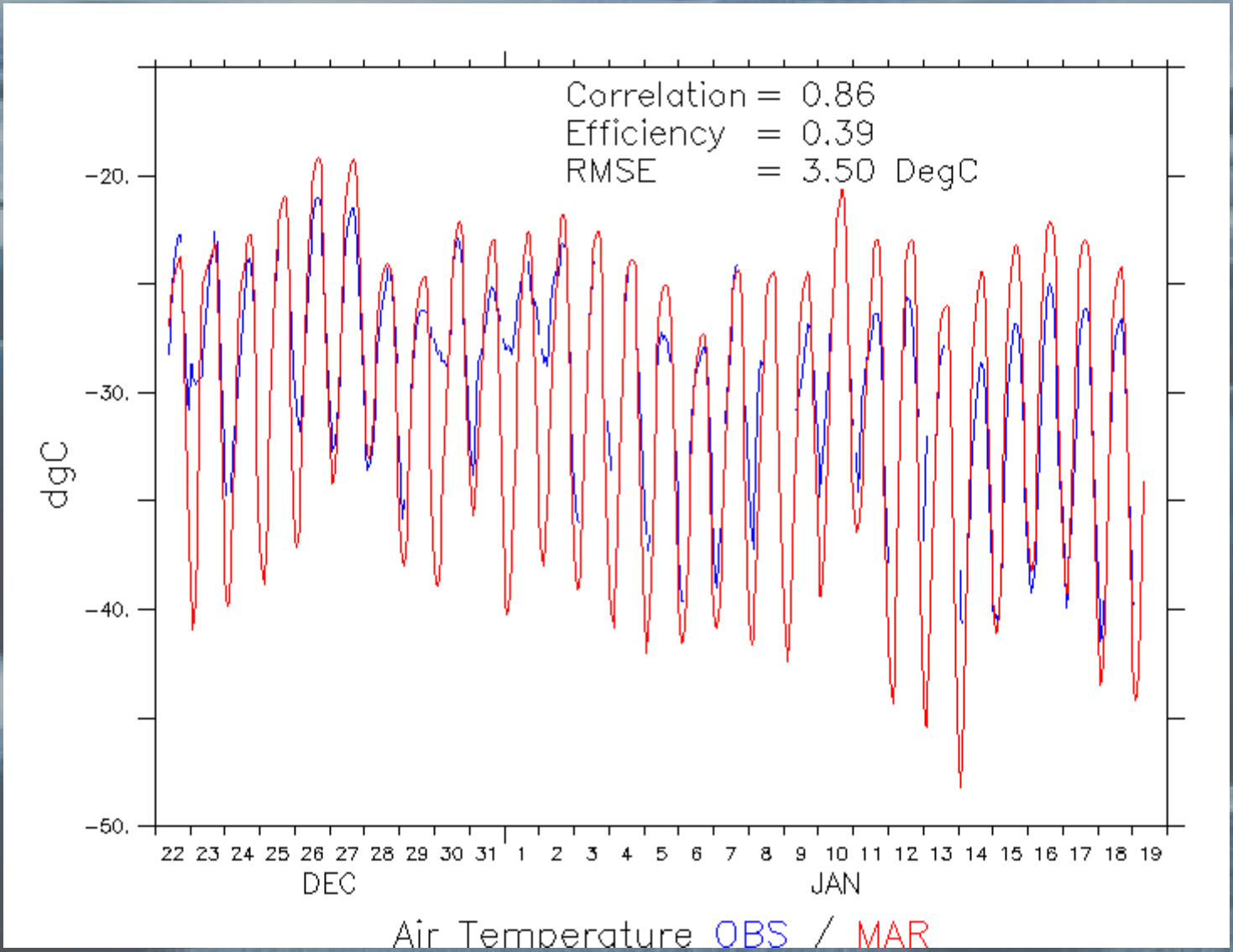
$E = 1 - RMSE^2 / \sigma^2$

E: Efficiency

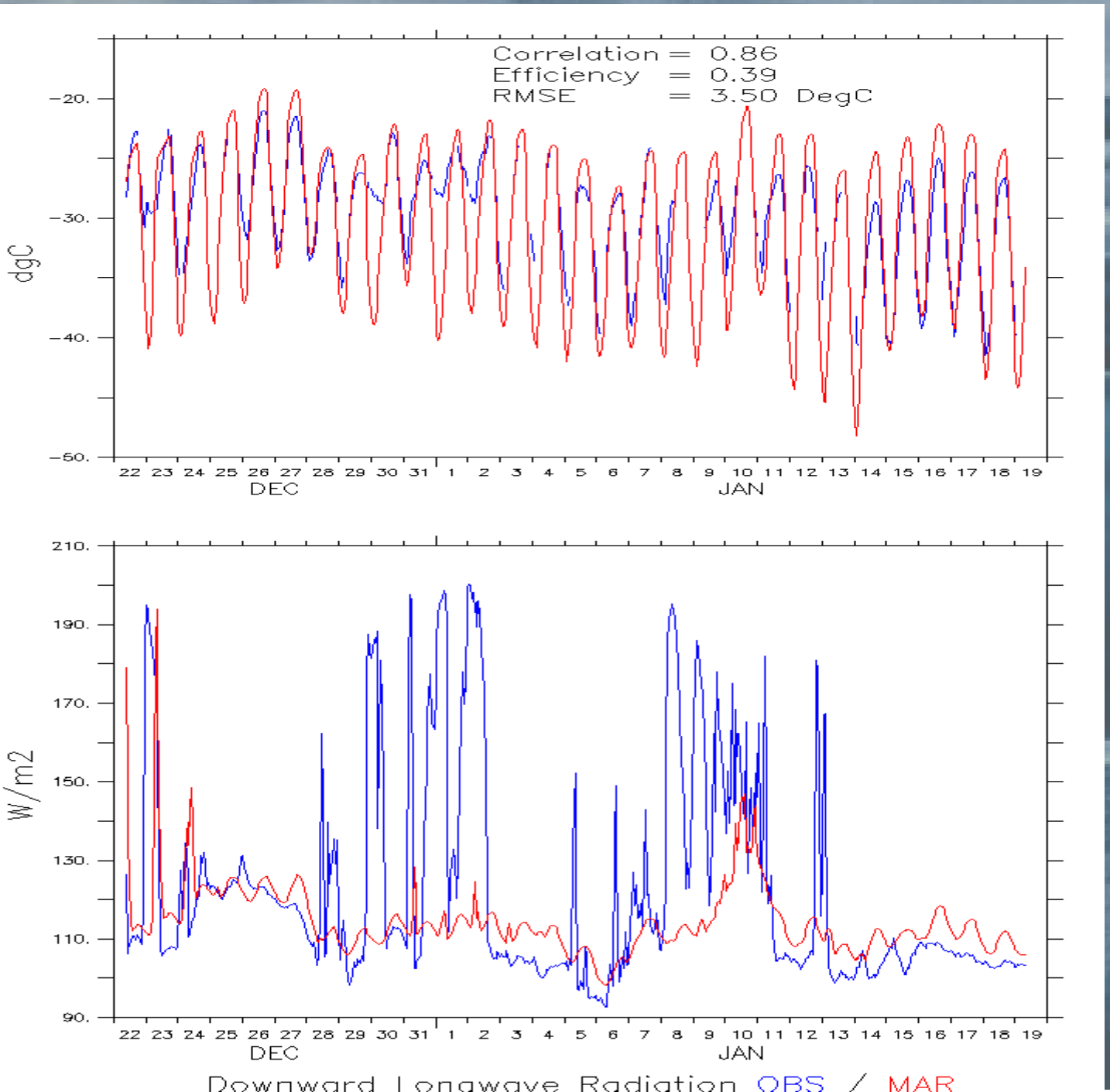
RMSE: Root Mean Square Error

σ: Standard Deviation (OBS)

MAR over Dome C



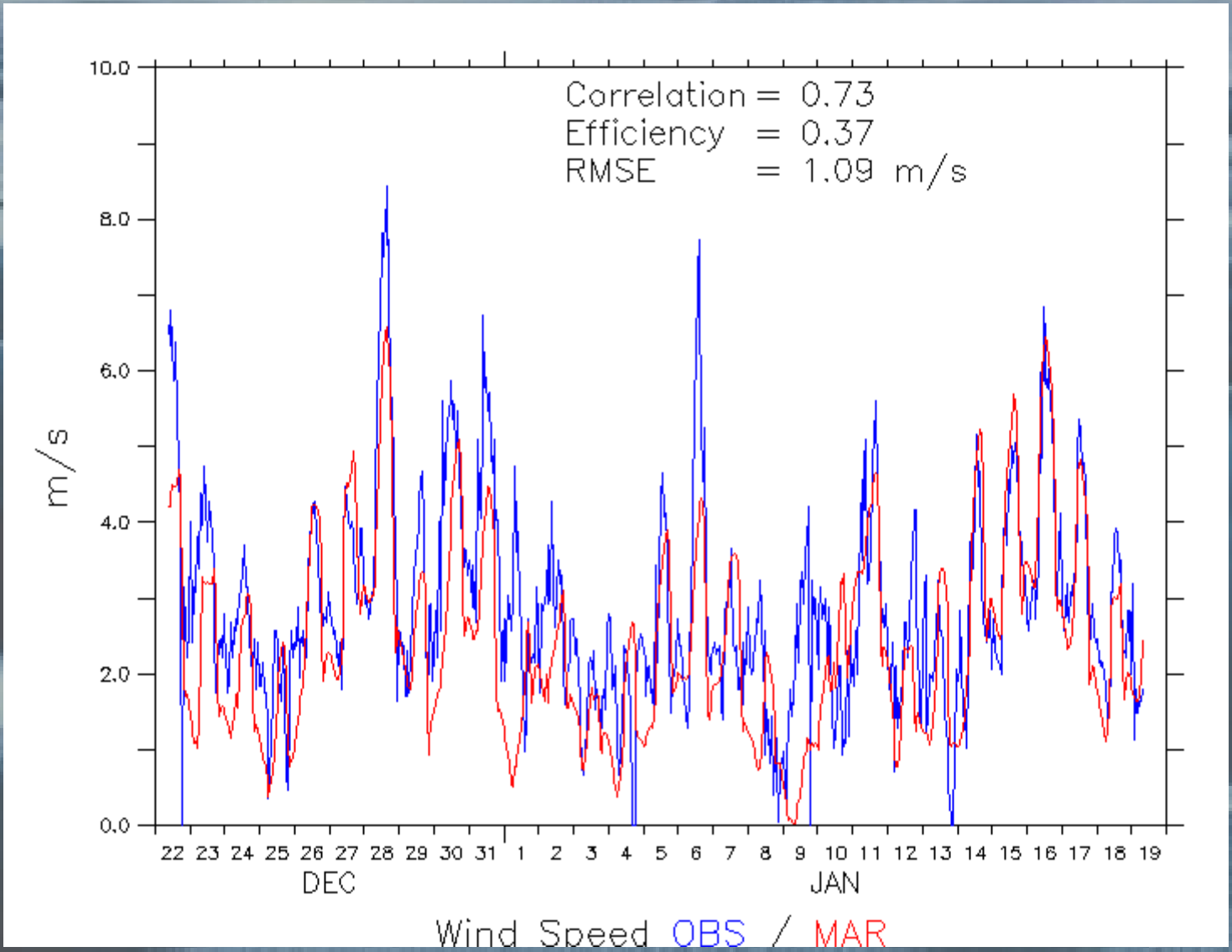
MAR over Dome C



MAR over Dome C

		| DLW(MAR) – DLW(OBS) | < 90 W m-2
Temperature		
Correlation	*0.86*	*0.92*
Efficiency	*0.39*	*0.64*

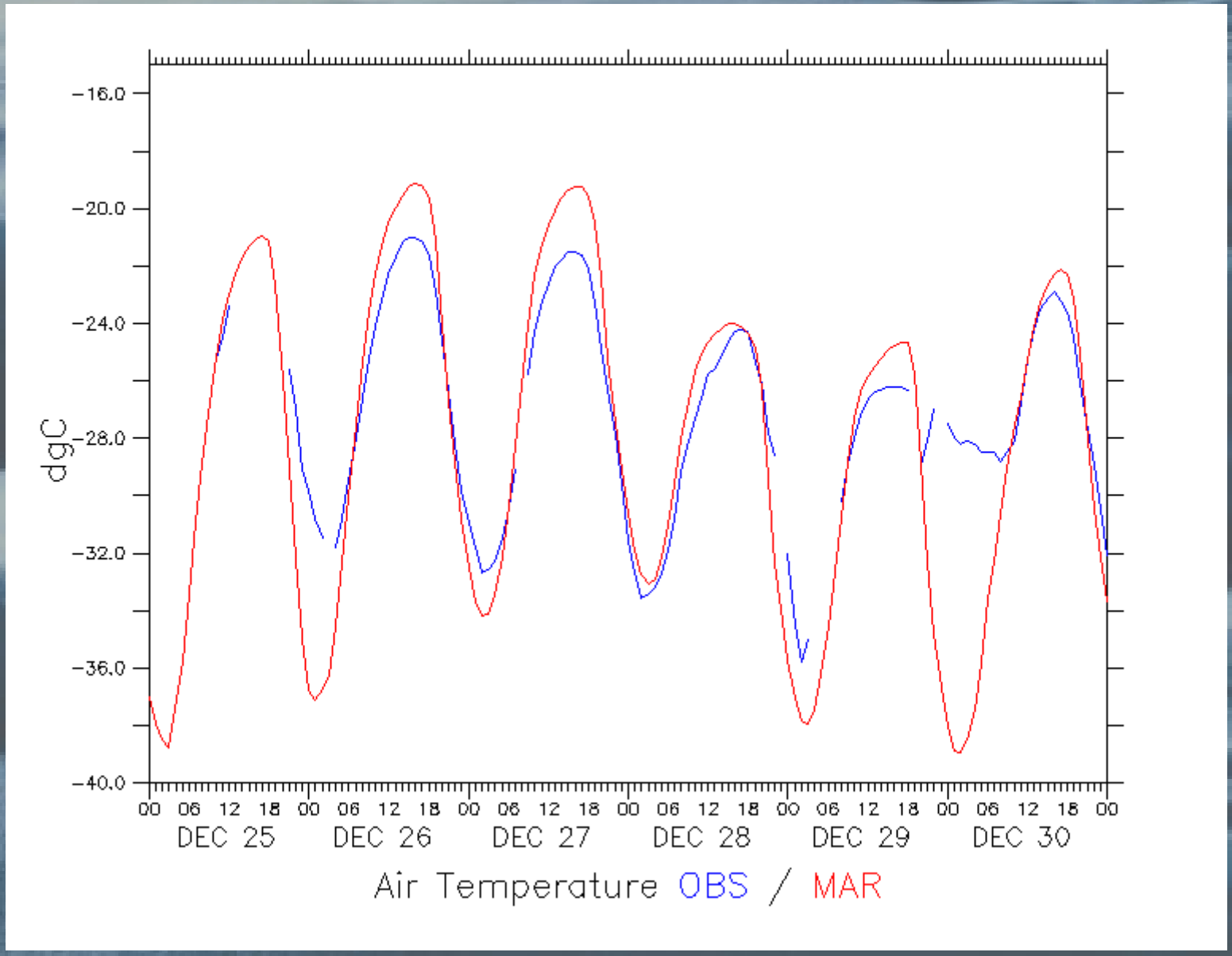
MAR over Dome C



MAR over Dome C

Wind Speed		| DLW(MAR) – DLW(OBS) | < 90 W m-2
Correlation	*0.73*	*0.89*
Efficiency	*0.37*	*0.75*

MAR over Dome C



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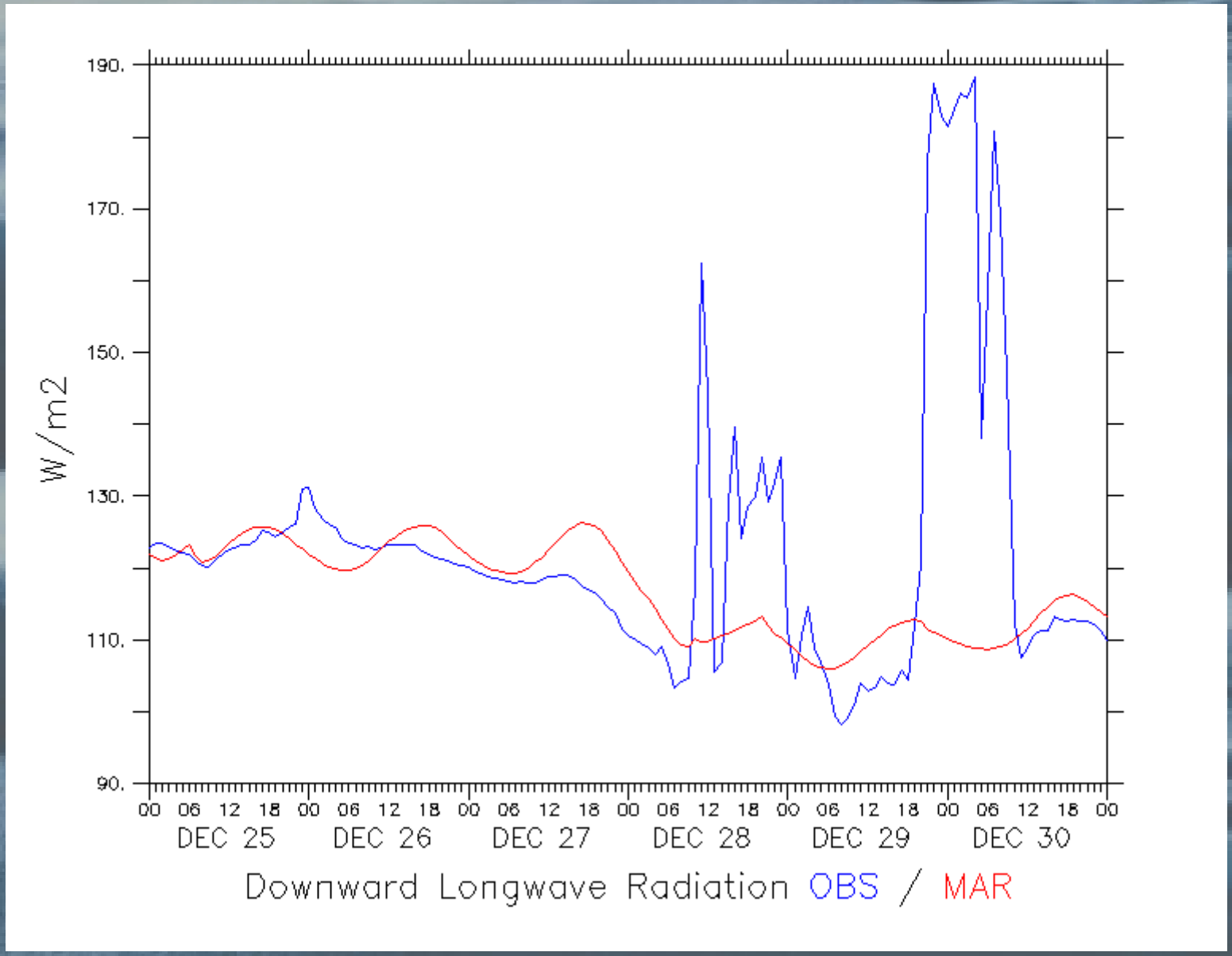

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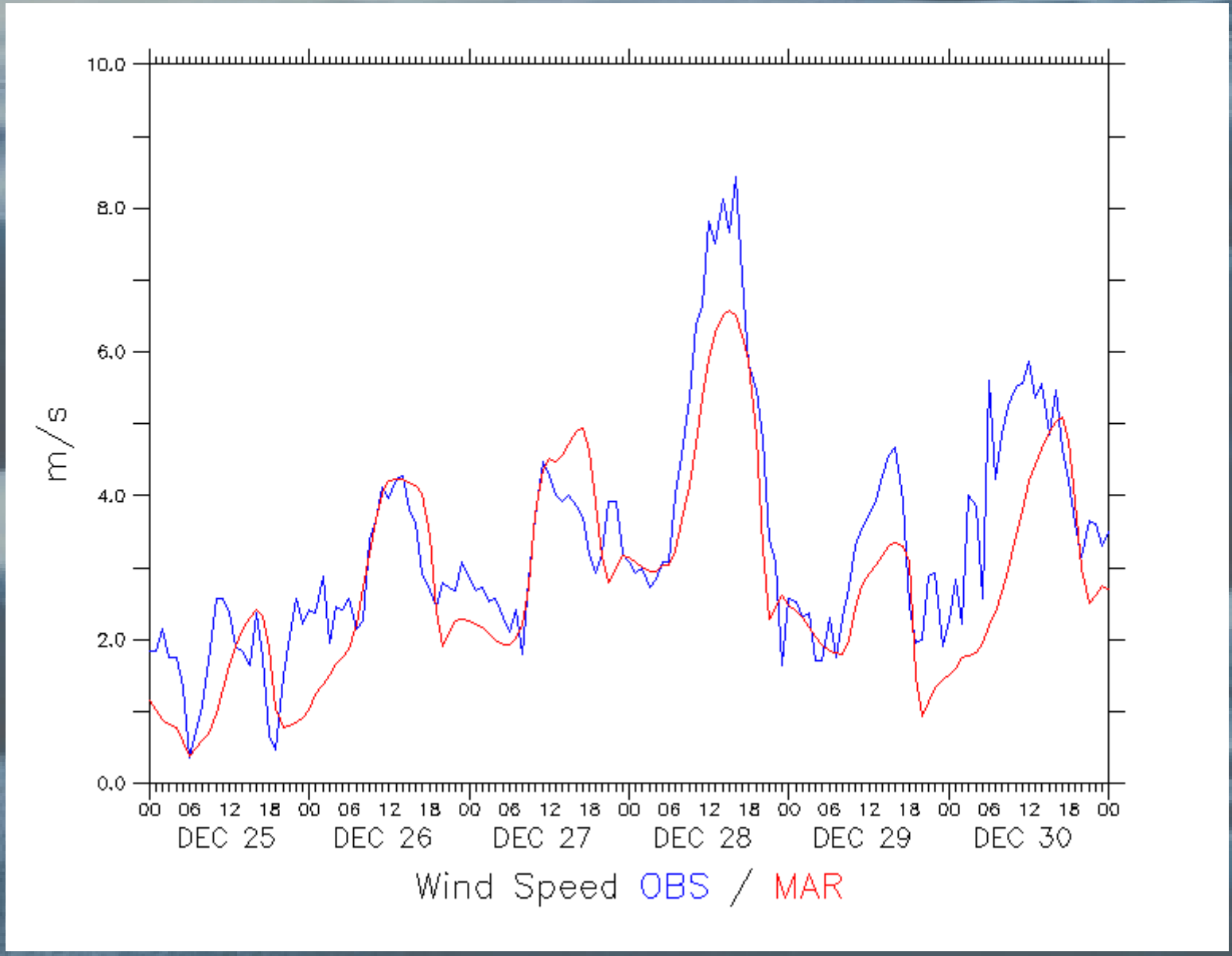

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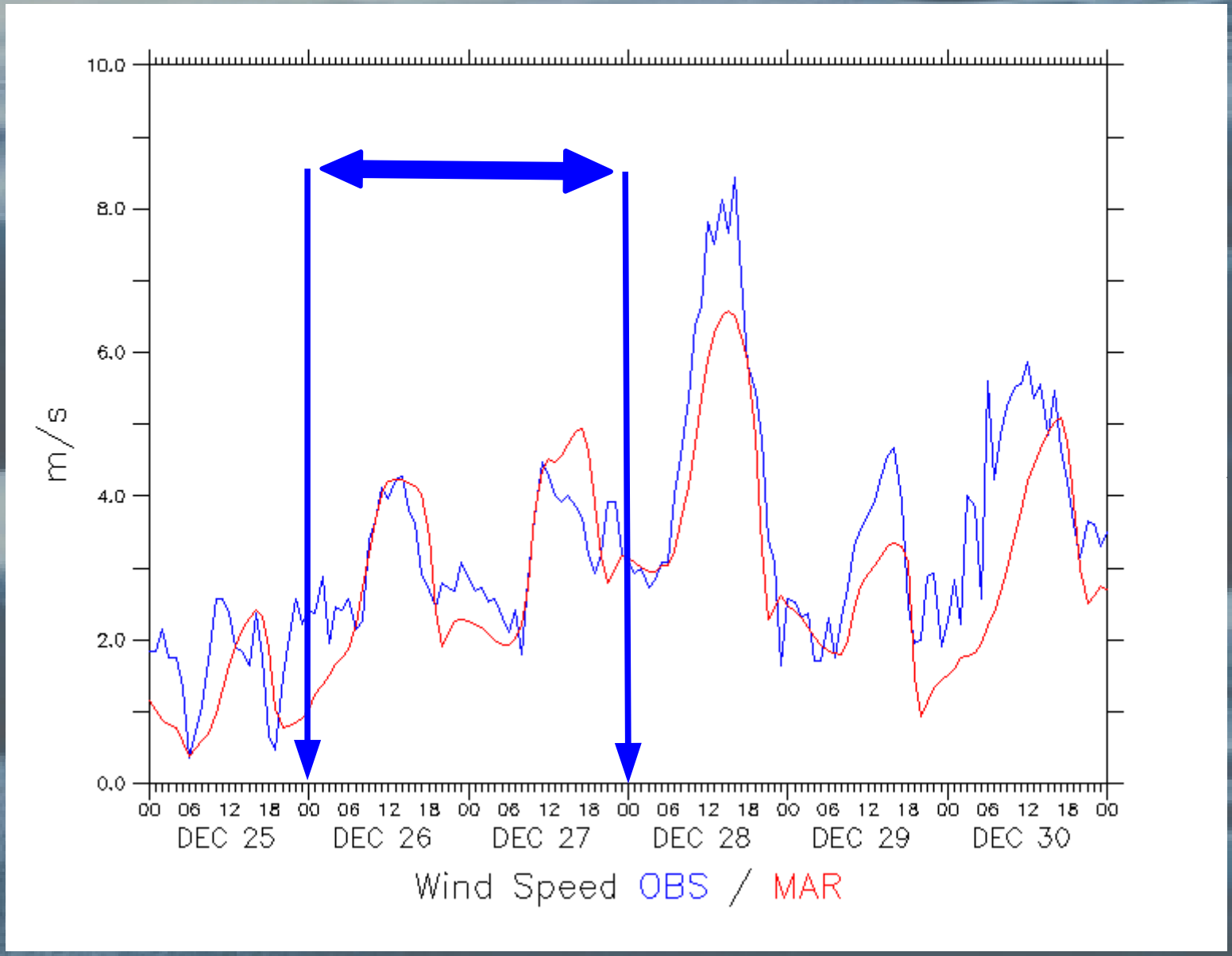
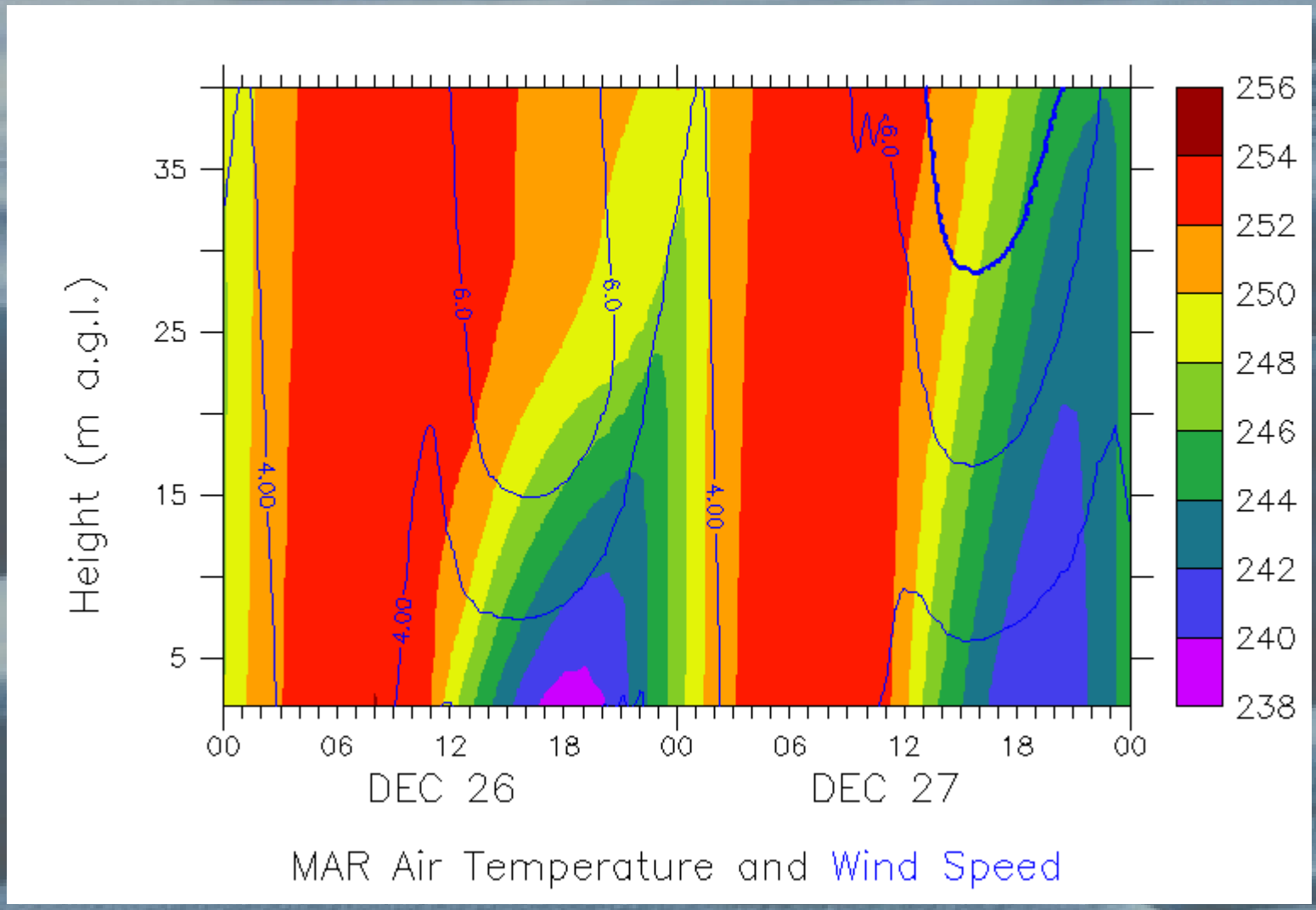


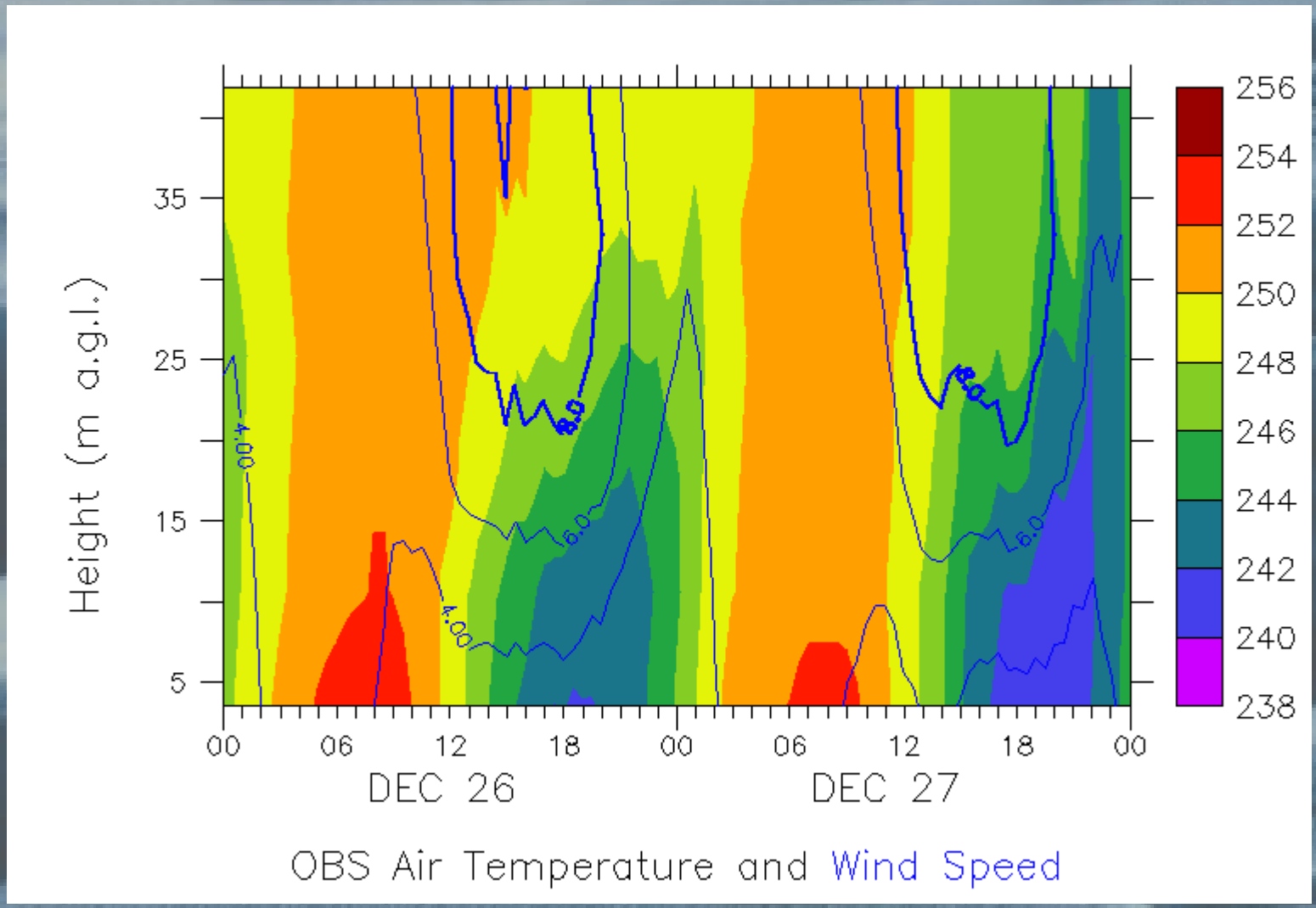
MAR over Dome C

Tower



OBS at Dome C

Tower



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Conclusions

- small domain / fine resolution
- clouds are underestimated
- diurnal cycle is overestimated
- positive efficiencies

=> relevance of such an exercise