A Site Atmospheric State Best Estimate for the temperature above Lauder, New Zealand

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Site Atmospheric State Best Estimates (SASBEs)

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  $\rightarrow$ estimate of uncertainty on each datum
- Exploit the value of well equipped sites
- Due to Lauders position, SASBEs very valuable for satellite validation

Lauder temperature SASBE 1996-2006

The current version of T-SASBE includes:

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The current version of T-SASBE includes:

- Weekly RS launches in Lauder
- Automatic weather station measurement in Lauder
- Twice daily RS launched in Invercargill
  $\rightarrow$ achieve a better temporal resolution

Regression model for Invercargill RS

Regression model to 'translate' RS from Invercargill to Lauder

$$T_{Lauder} = \underbrace{\alpha}_{\text{Term 1}} + \underbrace{\beta \cdot T_{Inv}}_{\text{Term 2}} + \underbrace{\gamma \cdot SLP_{Inv}}_{\text{Term 3}} + \underbrace{\delta \cdot GPH_{Inv}}_{\text{Term 4}} + \underbrace{\eta \cdot \Delta SP_{Inv-Lau}}_{\text{Term 5}} + \underbrace{\zeta \cdot \Delta\theta_{Inv-Lau}}_{\text{Term 6}} + \underbrace{\kappa \cdot \Delta ST_{Inv-Lau}}_{\text{Term 7}} + \underbrace{\epsilon}_{\text{Term 8}} \quad (1)$$

[1] Bodeker and Kremser, 2015

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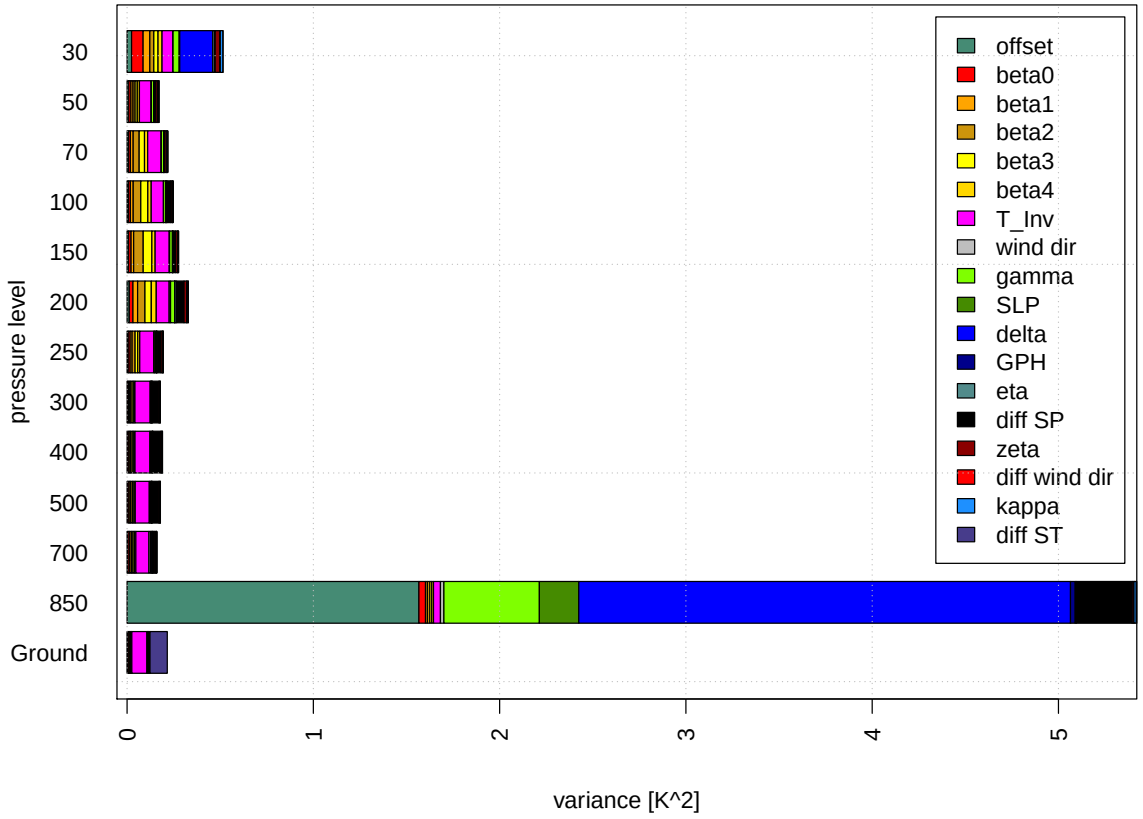
Each measured value and each regression coefficient[1] has an uncertainty!

$\rightarrow$ error propagation

[1] Bodeker and Kremser, 2015

Contribution of measurement uncertainty and uncertainty in regression coefficients



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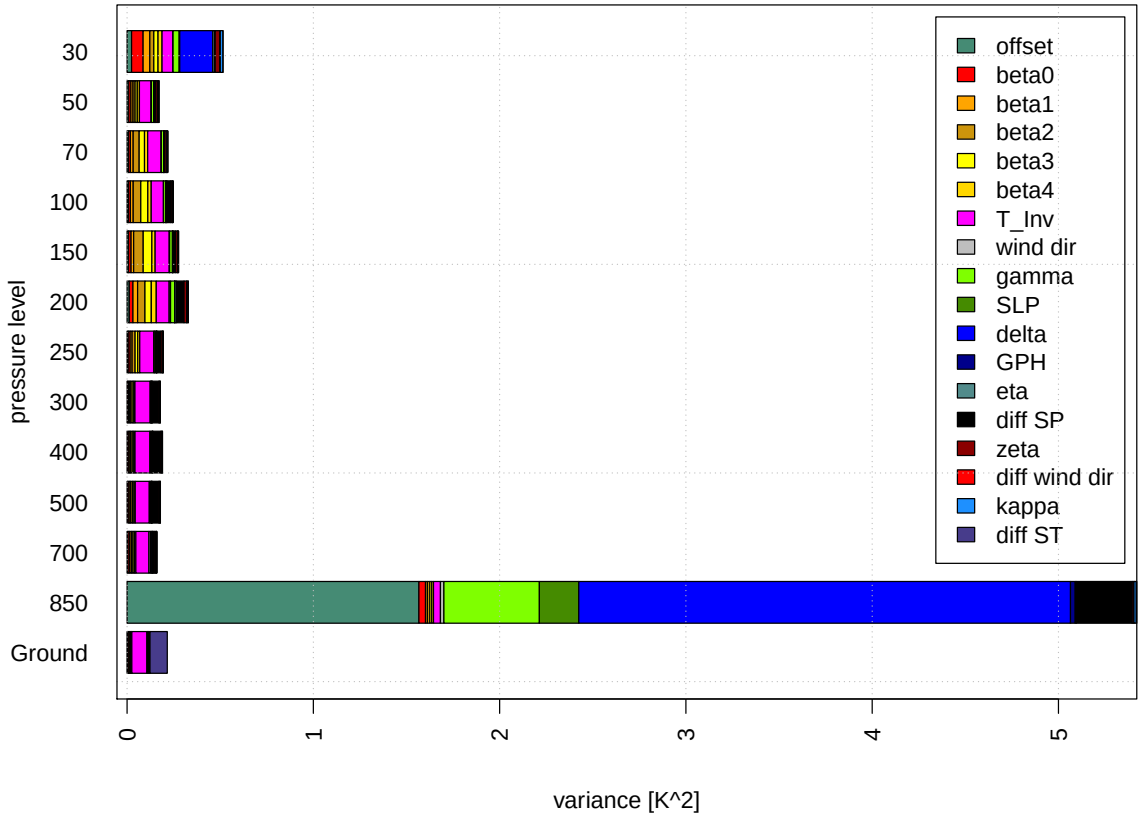
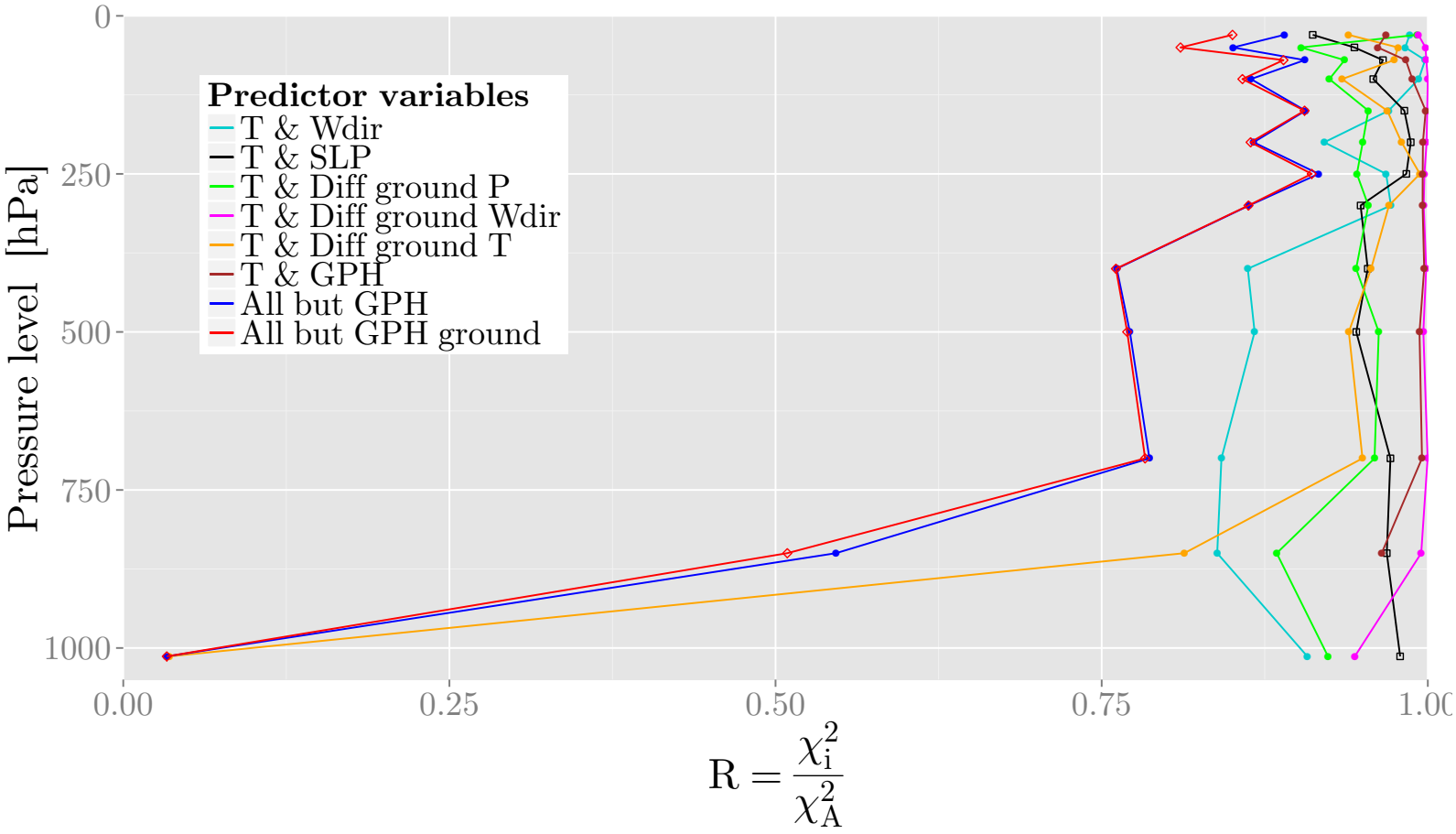


GPH minor improvement of model, but major contribution to uncertainty $\rightarrow$ eliminate gph

Value added by regression coefficients



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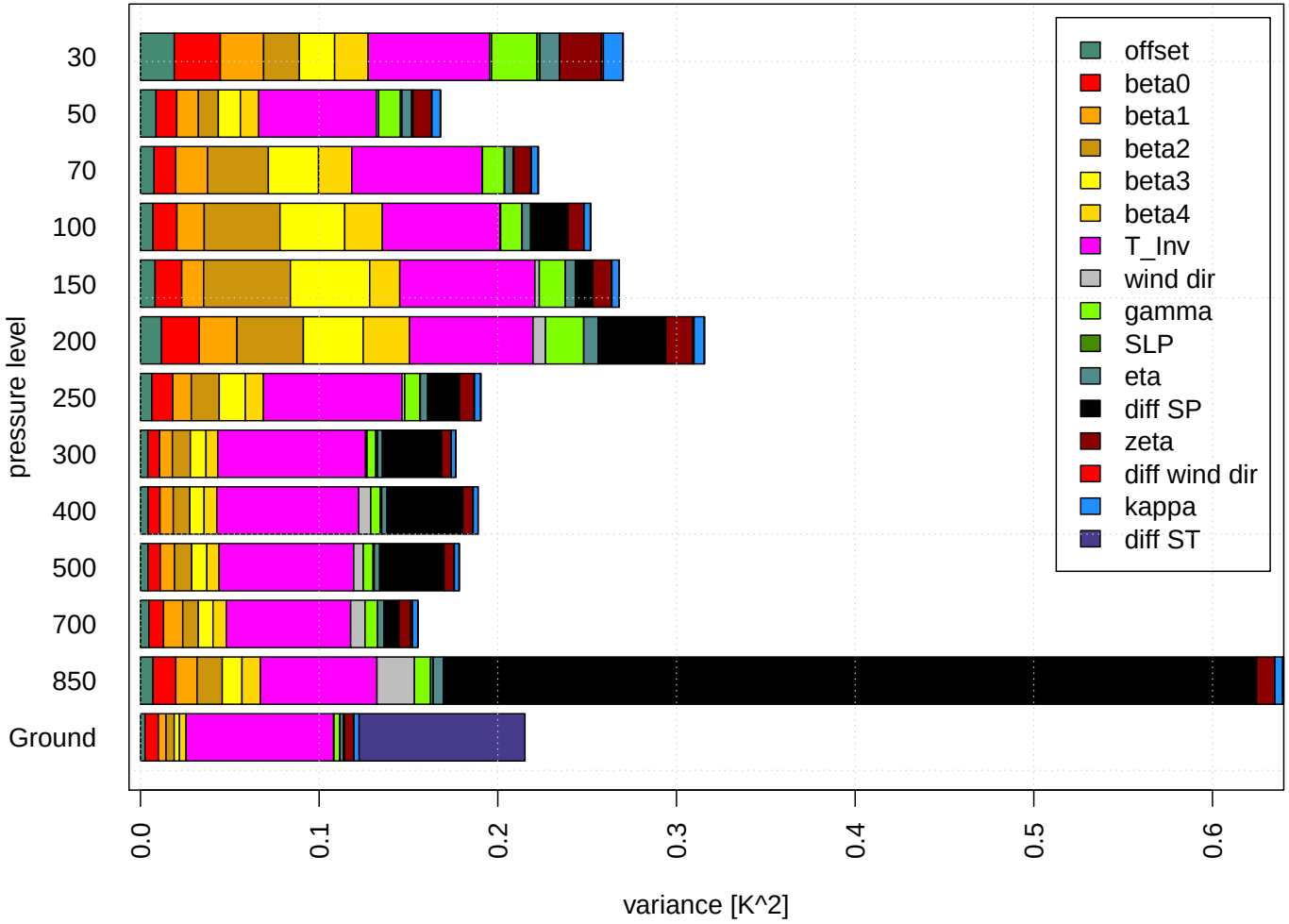
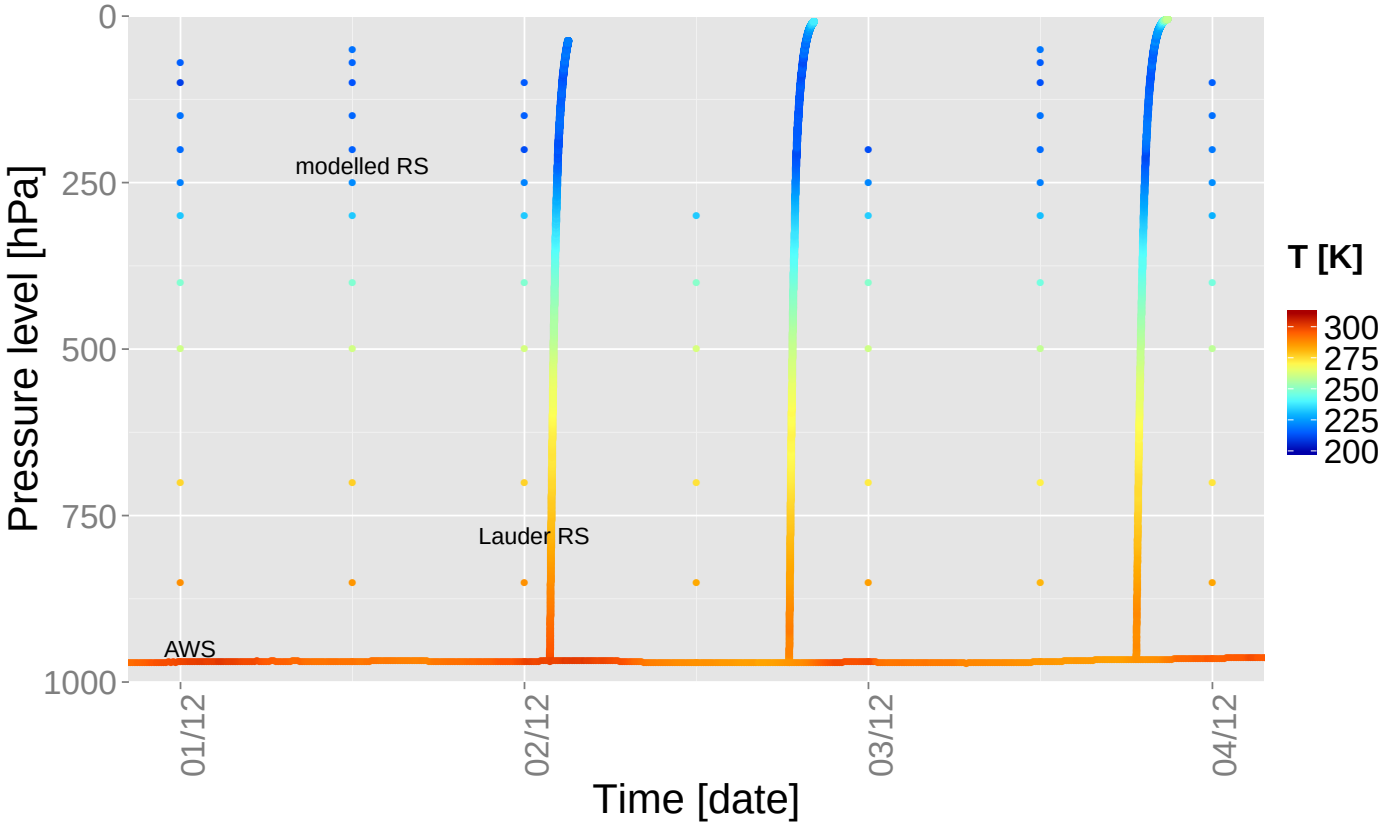


The temperature SASBE



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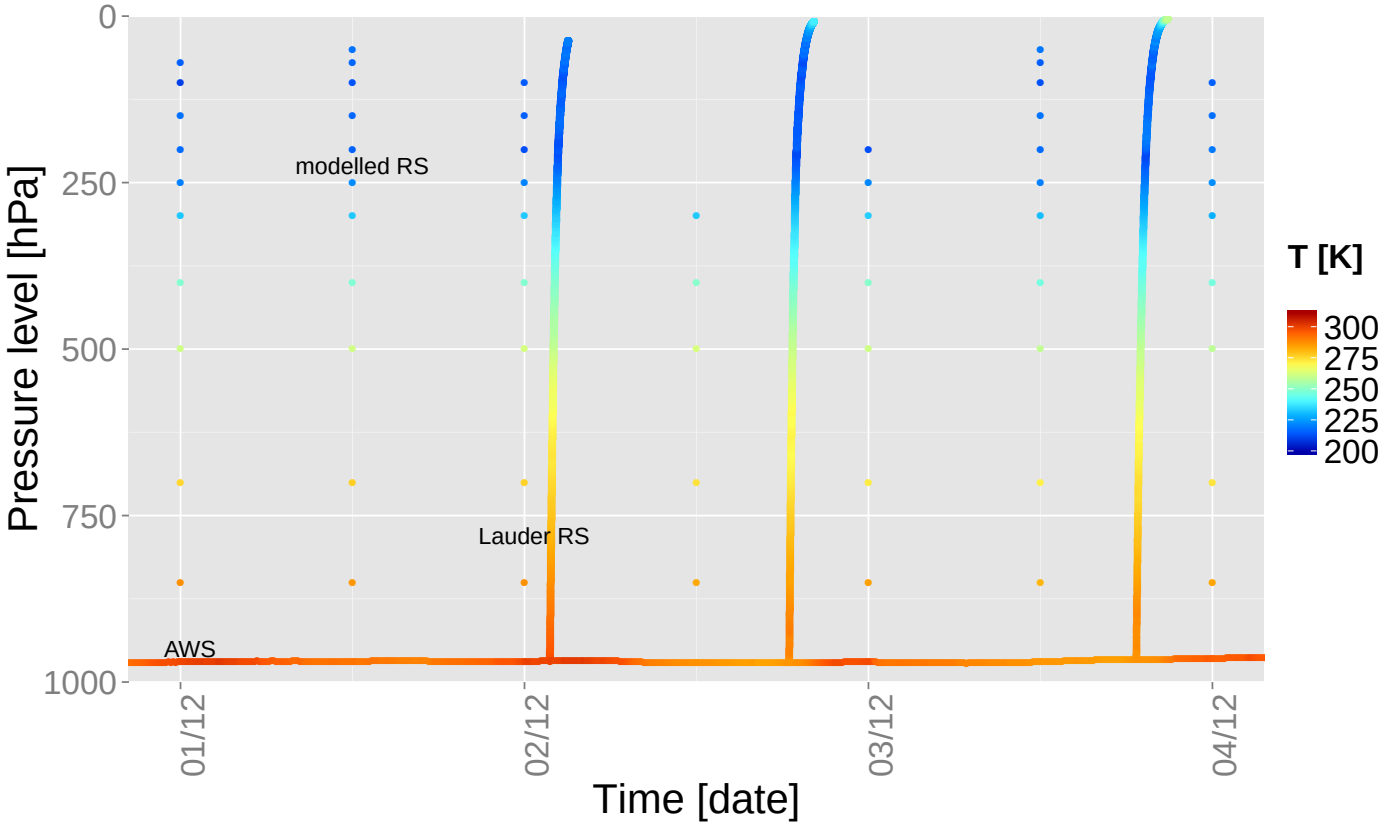

An interactive version of the T SASBE is available
http://sasbe.bodekerscientific.com/

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- Water vapour and ozone SASBE planned

Thank you for your attention!