



Estimation of soil moisture retrieval parameters using multi-angular L-band observations

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Background – SMOS and multi-angle retrieval

- MIRAS Microwave Interferometer with Aperture Sythnesis (L-band)
- Y-shaped antenna with three arms of ~6.5 m
- Total of 69 radiometers (54 along arms)







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- Retrieval algorithms mainly developed from simulations and tower-based experiments

-> Validation required





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Forward Model





Data Set I

Goulburn River Catchment – National Airborne Field Experiment 2005





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Forward Model – Default parameter





-> significant difference between simulation and observation





Forward Model – Roughness effect (Hr)





-> difference between simulation and observation reduced, but trend for large angles not captured



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Forward Model - Veg structure effect (tt_P)





Simulated Brightness Temperature (K)

RMSE for Merriwa Park Simulations



Simulated Brightness Temperature (K)



Effect of tt_p parameter on model performance





Data Set II

Murrumbidgee River Catchment/Yanco – National Airborne Field Experiment 2006





Summary

Forward simulation results were improved by modifying the default parameters (Wigneron et al., 2007):

- *i*) *H_r*...surface roughness
- *ii)* tt_p ...angular effect of the vegetation structure
- -> RMSE for Merriwa Park data reduced from ~37K to ~2.5 K
- -> vegetation structure effect more dominant for wet soil condition/ high VWC