

# Calibration schemes

Presented by  
**Xavier Neyt / RMA**



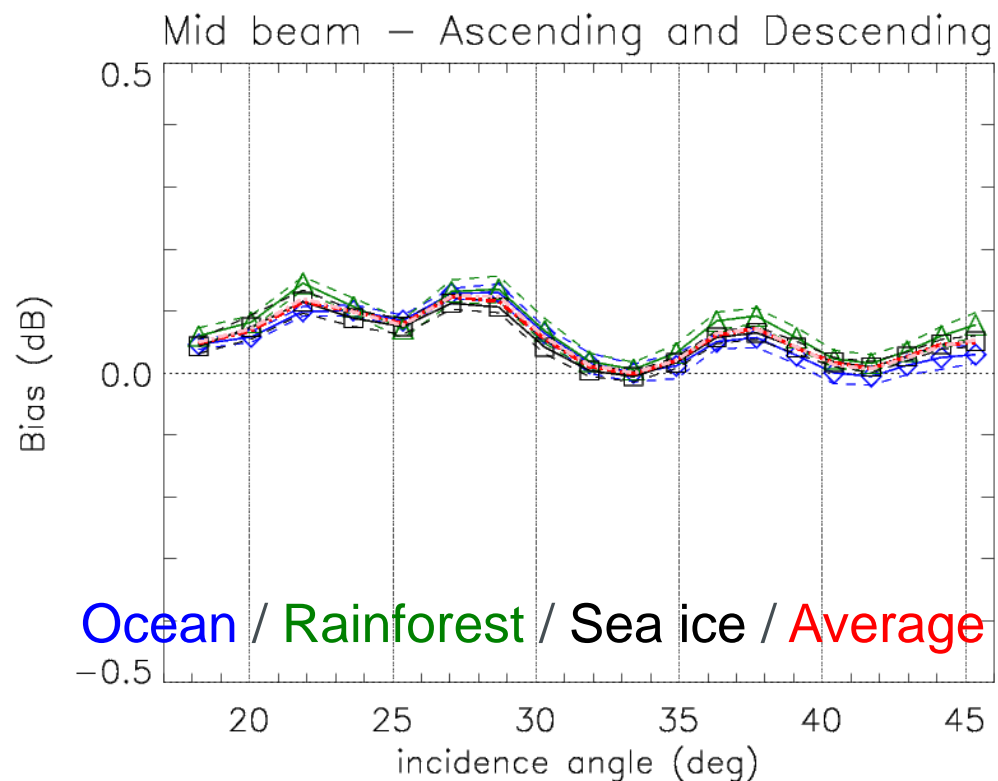
**scirocco**  
scatterometer instrument  
competence centre

- Tools
  - Distributed targets
  - ERS1 – ERS2 comparison
  - ERS2 – ASCAT-A comparison
- Sensitivity analysis
  - To seasonal effects
  - To spatial coverage differences (global vs regional)
  - To model effects
- Aft beam anomaly
  - Analysis
  - Way forward

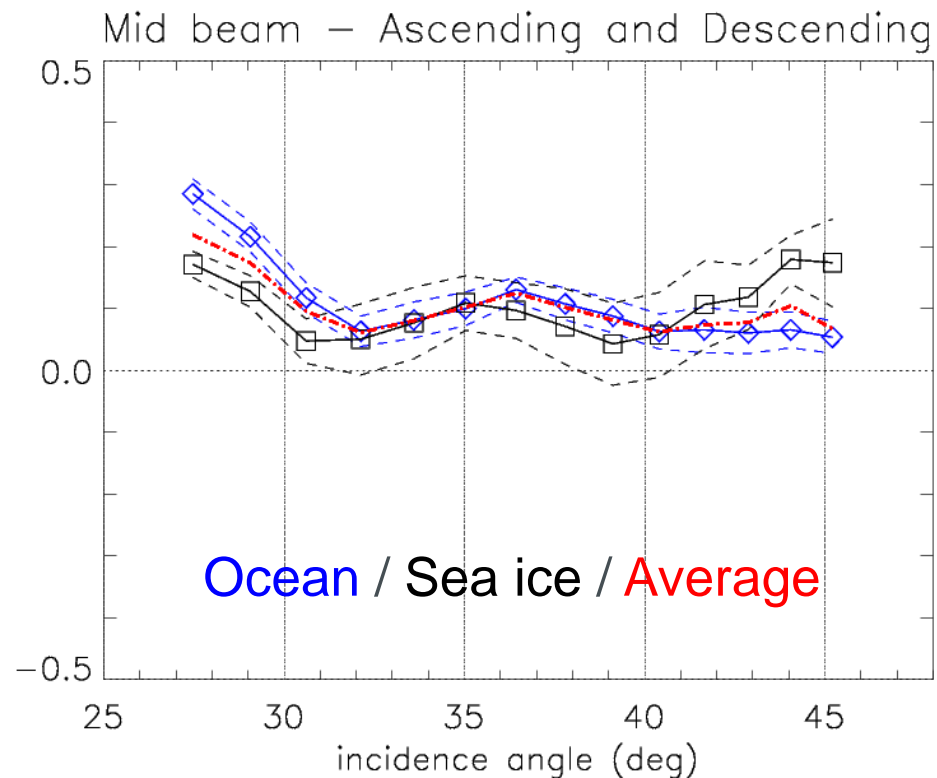
- Combine different approaches (natural targets + geophysical models)
  - Ocean + CMOD5
  - Rainforest + constant gamma model
  - Sea ice + ice line model
- Compute model bias for each sensor
  - Model bias<sub>i</sub> (incidence, beam) = scatt<sub>i</sub> - model
- Compute cross-calibration bias
  - Bias(incidence,beam) = Model\_bias\_1 – Model\_bias\_2

# ERS1 – ERS2 comparison

- Good agreement among the different methods
- Low variance of each method
- Gain bias detected between ERS-1 and ERS-2



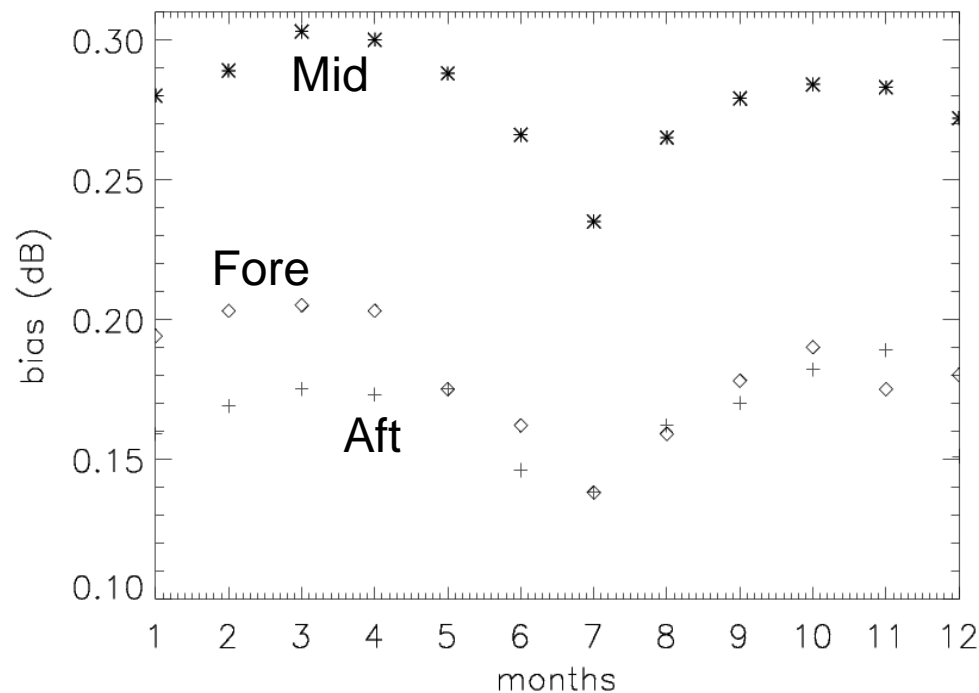
- ERS2 in regional mission scenario
  - Small coverage of RF
  - Limited coverage over sea ice
    - Large variance of sea ice bias
  
- Poor agreement between the methods
  - Possibly due to limited coverage over sea ice (?)



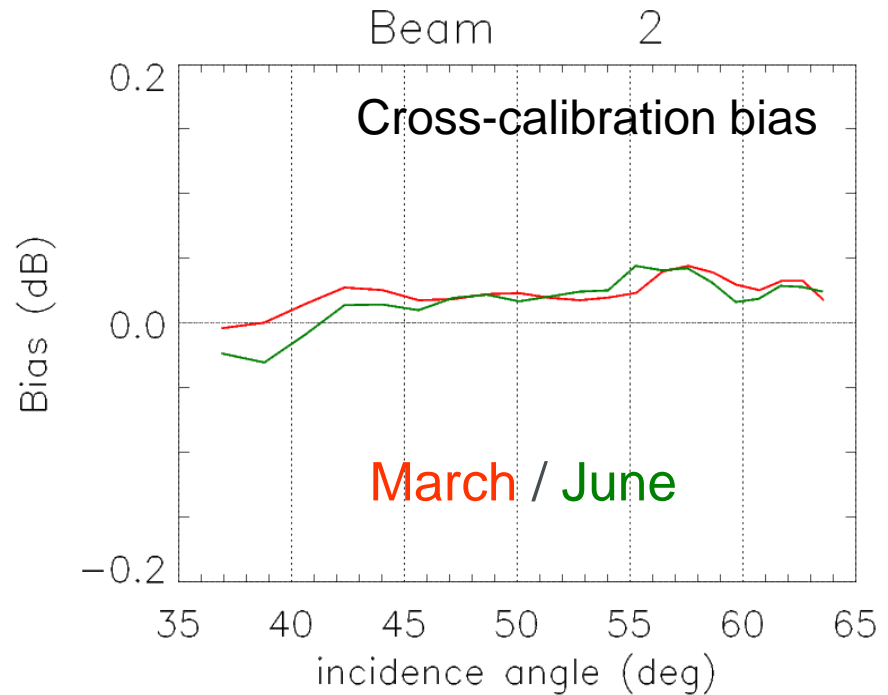
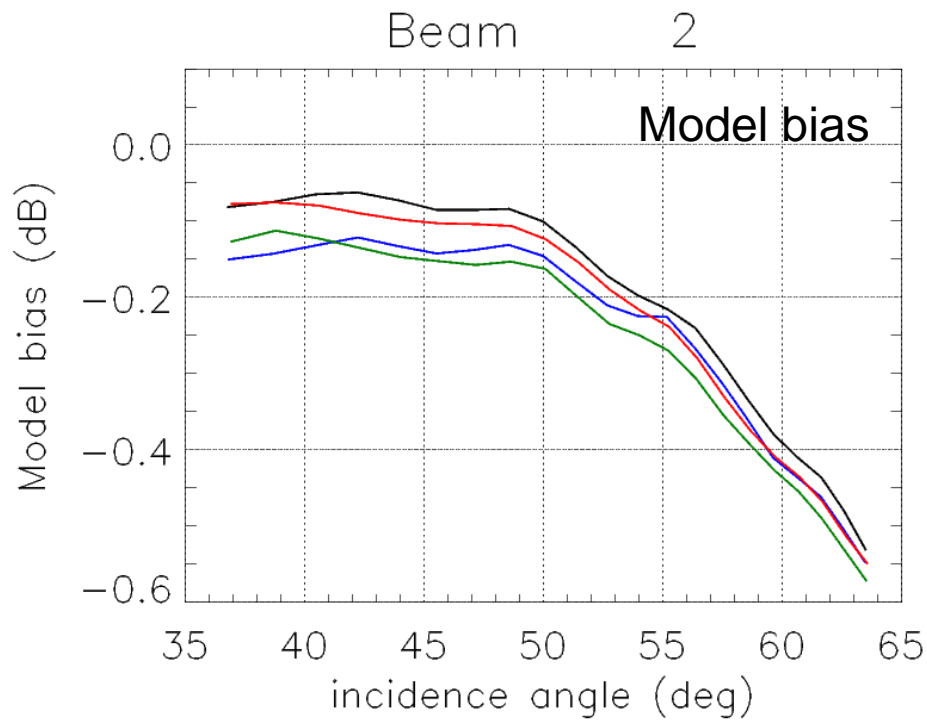
## Seasonal effect

- Model bias: changes with time
  - Ocean model bias depends on wind PDF

Ocean model bias (ASCAT-A) 2009



# Sensitivity to seasonal effects

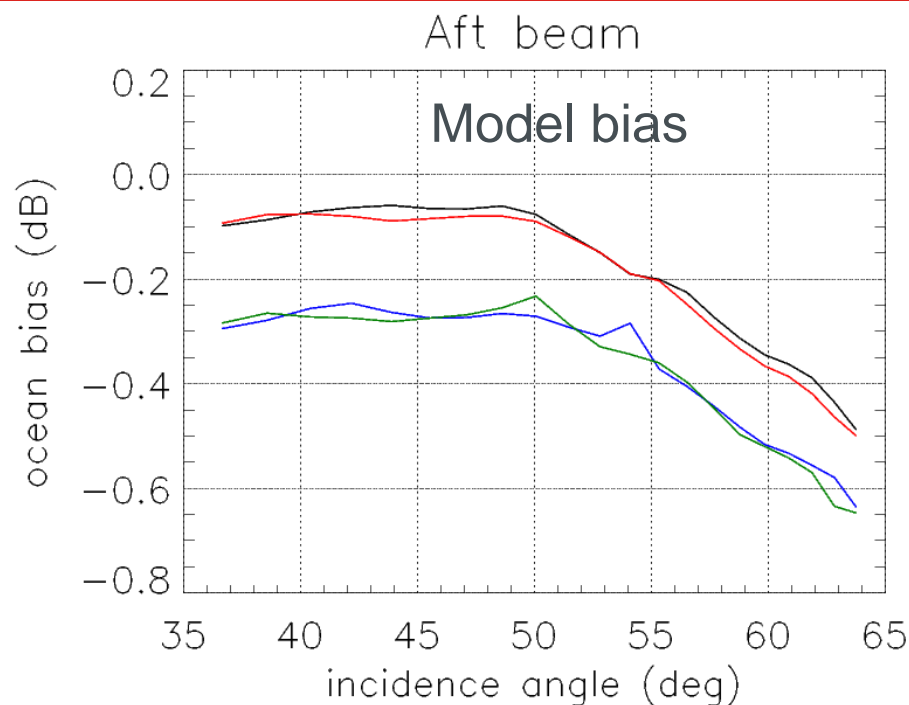


ASCAT-A, **ASCAT-B**: March (higher model bias)

**ASCAT-A**, ASCAT-B: June (lower model bias)

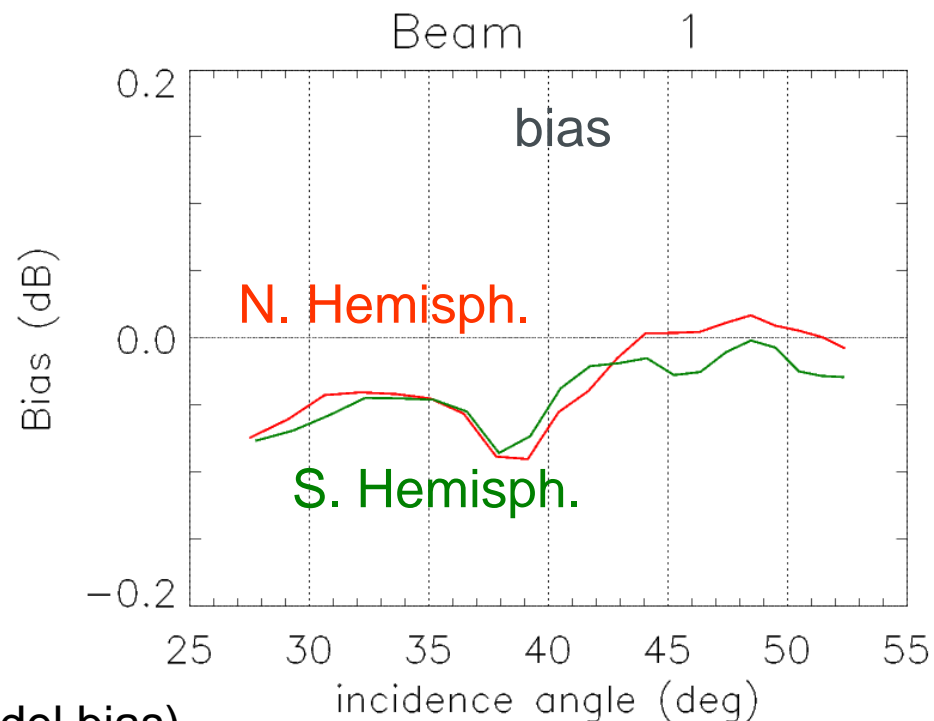
**Cross-calibration mitigates the seasonal effect**

# Sensitivity to seasonal effects



ASCAT-A, ASCAT-B: N. Hemisph. (higher model bias)

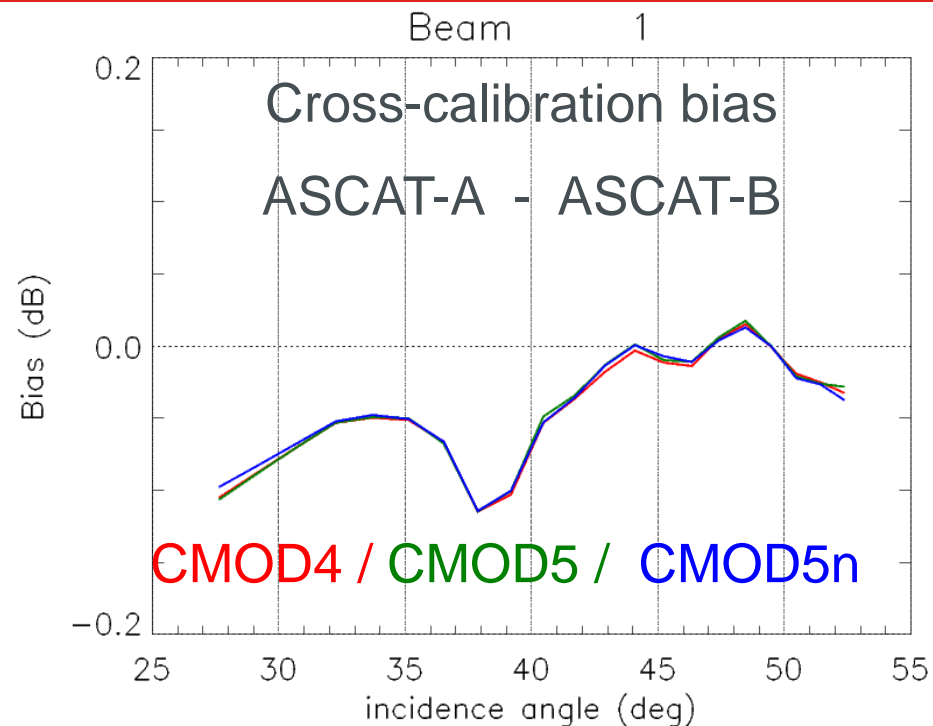
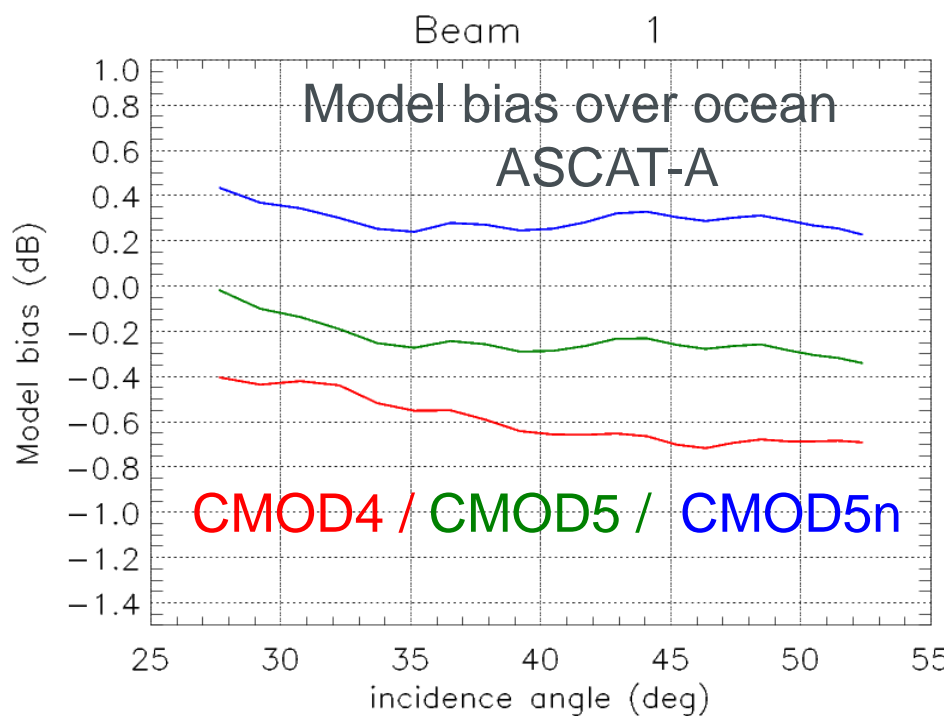
ASCAT-A, ASCAT-B: S. Hemisph. (lower model bias)



- Application: ERS2 regional mission scenario



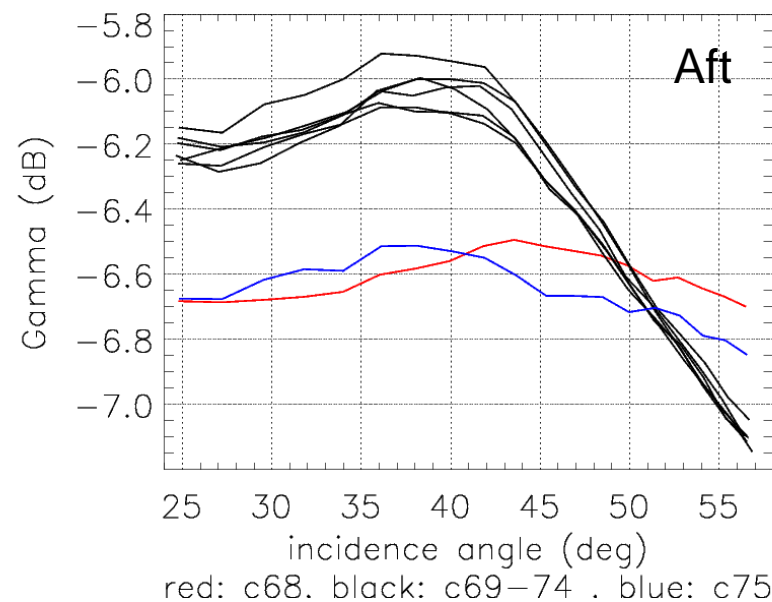
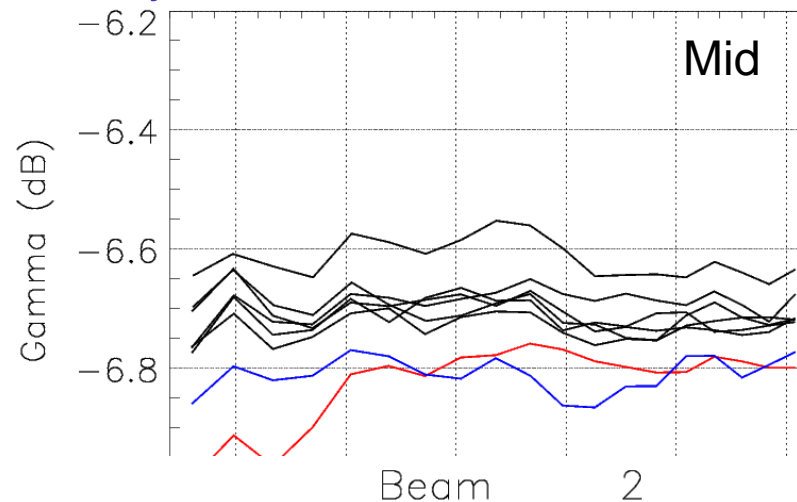
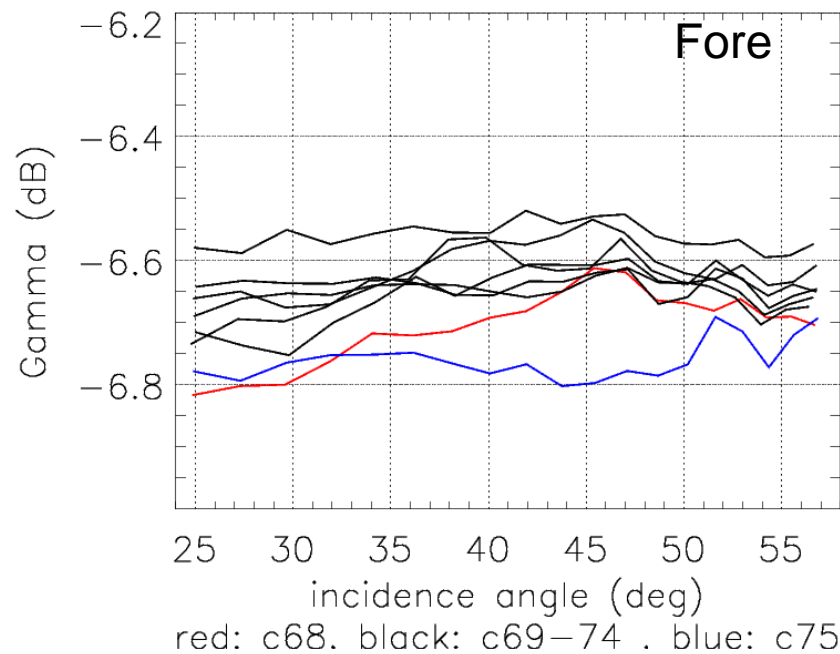
# Sensitivity to model differences



- Model bias depends on the model used
- bias is independent of the model

# Aft beam anomaly Rainforest

Beam 0 / Cycle 68 / Cycles 69-74 / Cycle 75 Beam 1



- The three antennas affected (gain increase)
- Impact on aft beam is extreme

22-Oct-2014



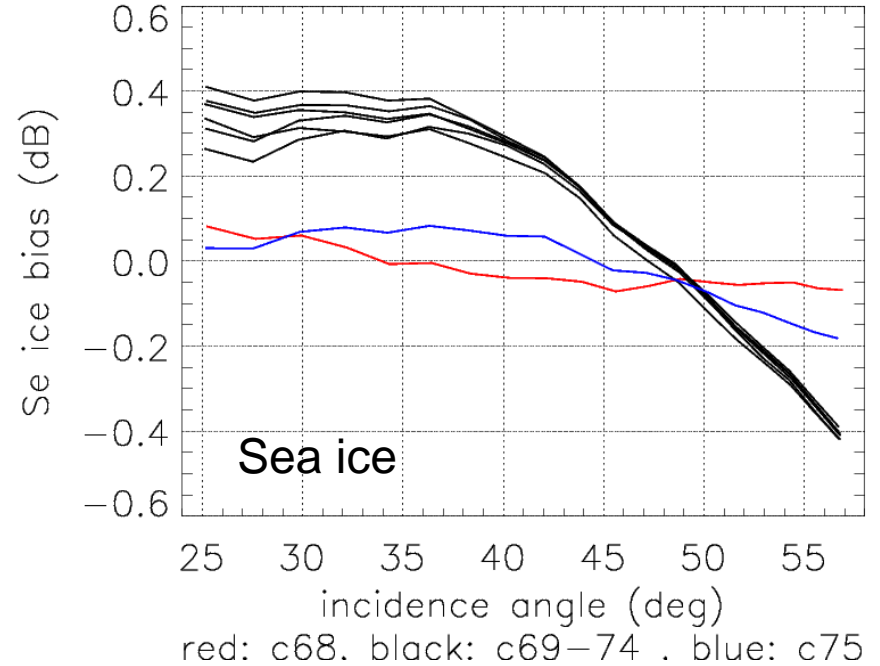
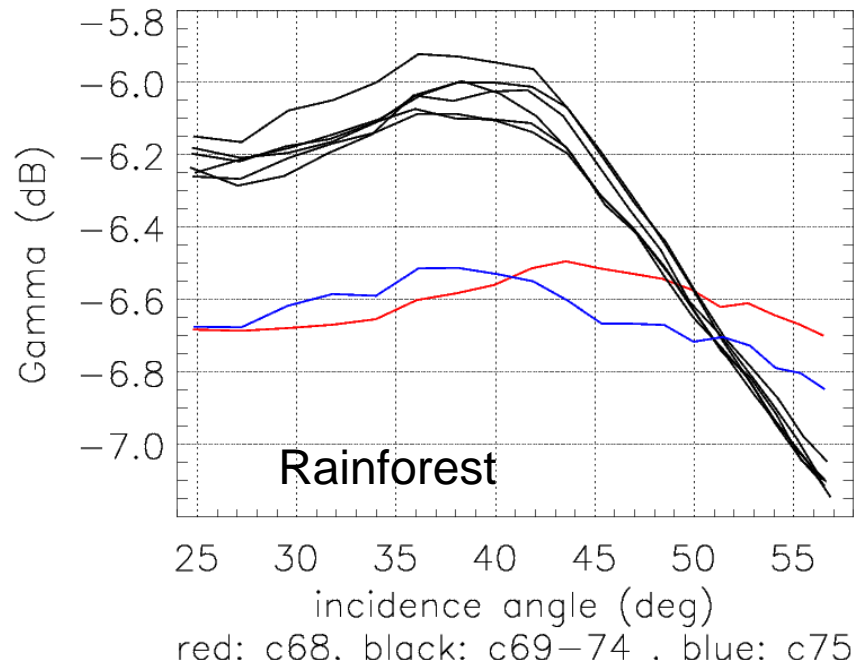
# Aft beam anomaly

## Rainforest and sea ice

Cycle 68 / Cycles 69-74 / Cycle 75

Beam 2

Beam 2



- Not exactly the same pattern but very similar



# Way forward

- Identify exact date (orbit?) of begin / end
  - See report from Giovanna
- Recompute calibration coefficients using agreed-on reference
  - See item 11

22-Oct-2014