ASCAT RADIOMETRIC PERFORMANCE

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BASIC ERROR CONTRIBUTIONS

Static Calibration Bias Error

Gain Error $\varepsilon = \pm 0.017$ dB

Corresponding Cross-Section Error $e(\varepsilon) = \pm 0.034$ dB

Quasi-static Bias Error Around Orbit

Gain Error $\delta = +0.0525$ dB Worst Case LA

$\delta = +0.0029$ dB Best Case RM

Corresponding Cross-Section Error $e(\delta) = +0.1044$ dB WC

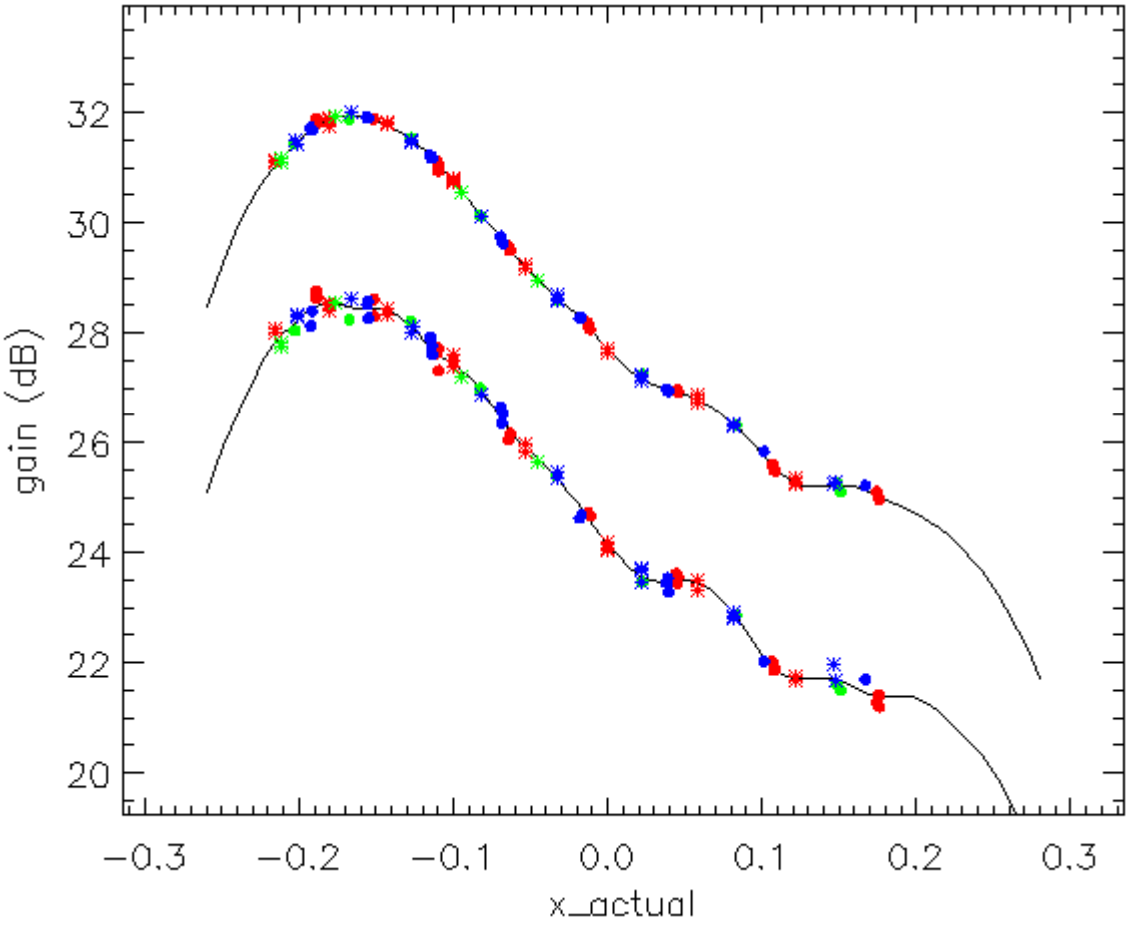
$e(\delta) = +0.0058$ dB BC

Calibration Noise-like Error (1 sigma)

Gain Error $\Delta = \pm 0.054$ dB

Corresponding Cross-Section Error $\sigma(\Delta) = \pm 0.10734$ dB

SATELLITE REFLECTION – LM BEAM



SUMMARY OF RADIOMETRIC PERFORMANCE

Point Target Cross-Section Single Measurement

Best Case	Worst Case
± 0.20 dB (2 sigma)	± 0.30 dB (2 sigma)
± 0.28 dB (3 sigma)	± 0.38 dB (3 sigma)

Distributed Target Normalised Cross-Section Single Measurement for Kp = 3%

Best Case	Worst Case
± 0.20 dB (2 sigma)	± 0.30 dB (2 sigma)
± 0.28 dB (3 sigma)	± 0.38 dB (3 sigma)

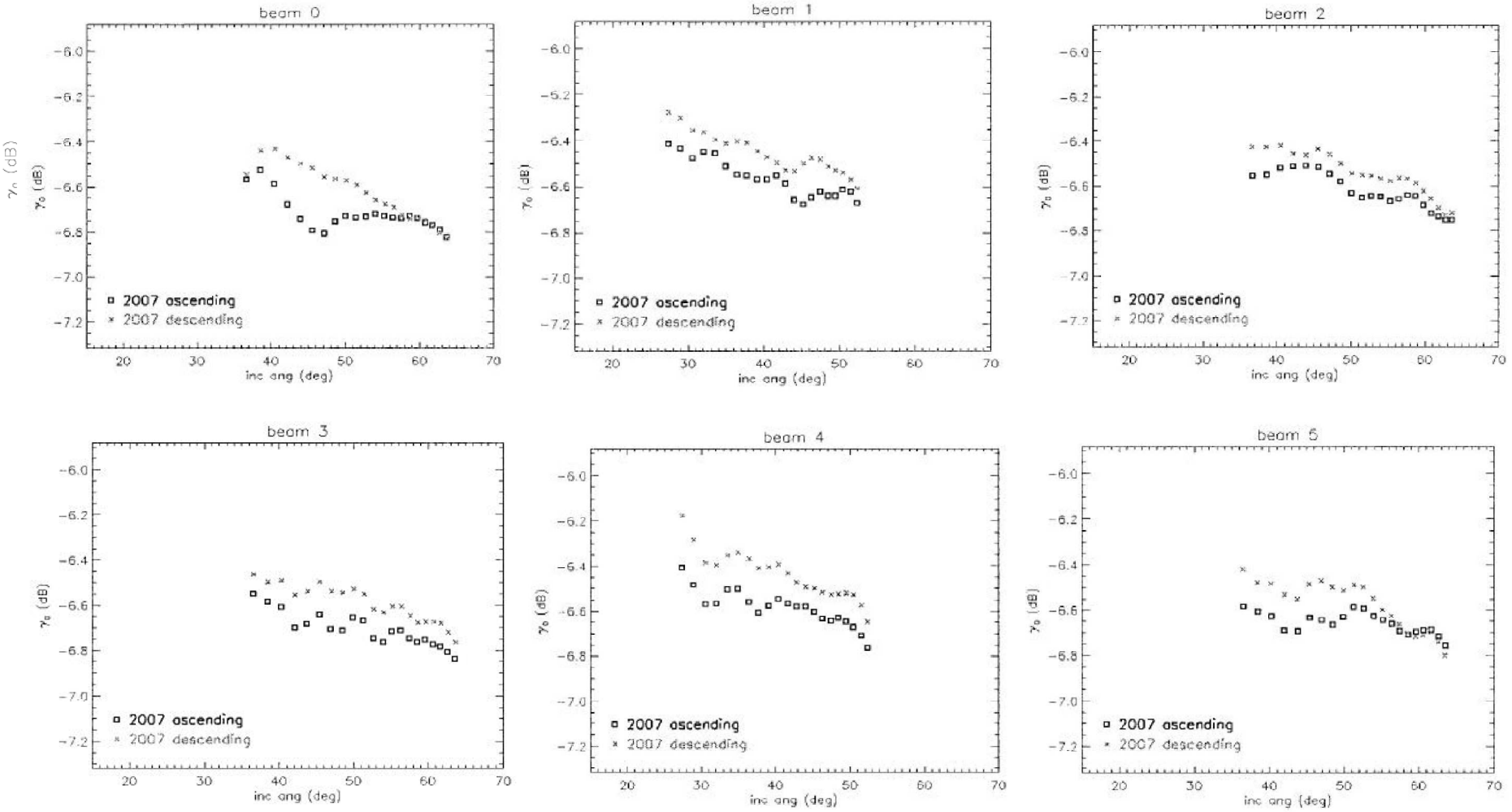
Residual Bias Contribution

Best Case	Worst Case
± 0.06 dB (2 sigma)	± 0.15 dB (2 sigma)
± 0.07 dB (3 sigma)	± 0.15 dB (3 sigma)

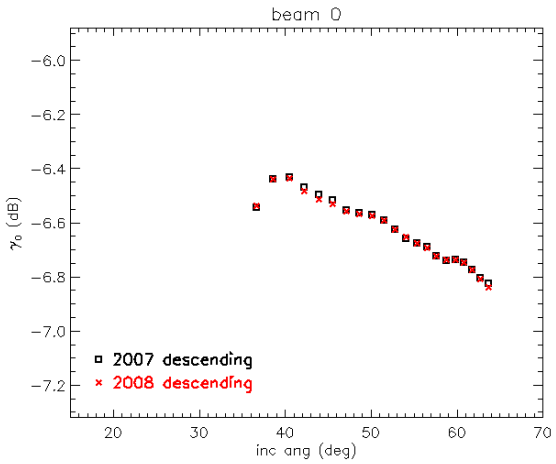
Re-Calibration Error Assuming Stability

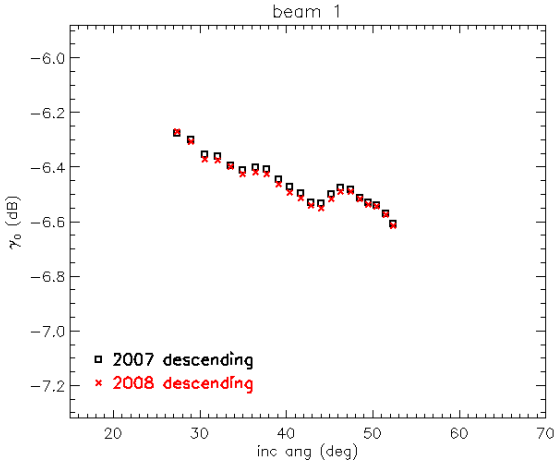
± 0.06 dB (2 sigma)
± 0.07 dB (3 sigma)

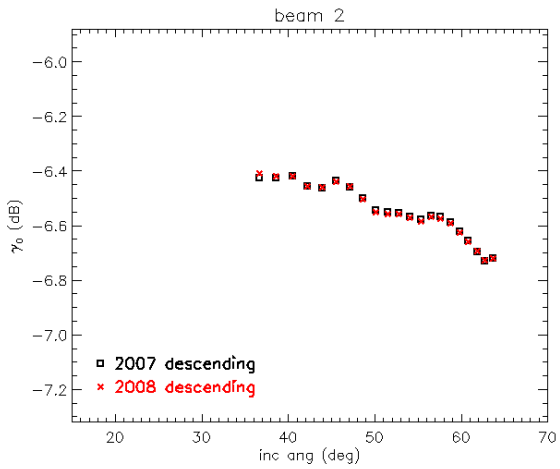
RAIN FOREST GAMMA ZERO 2007: ASC & DES

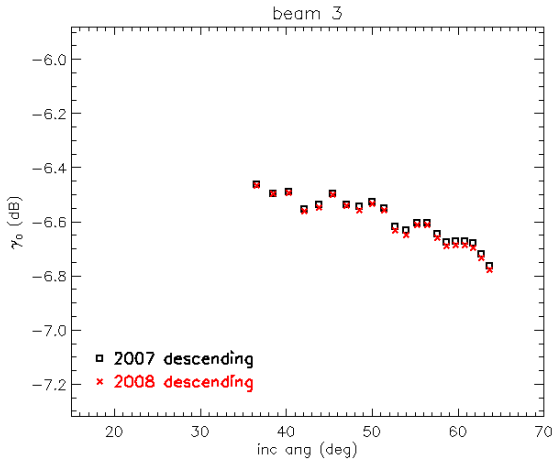


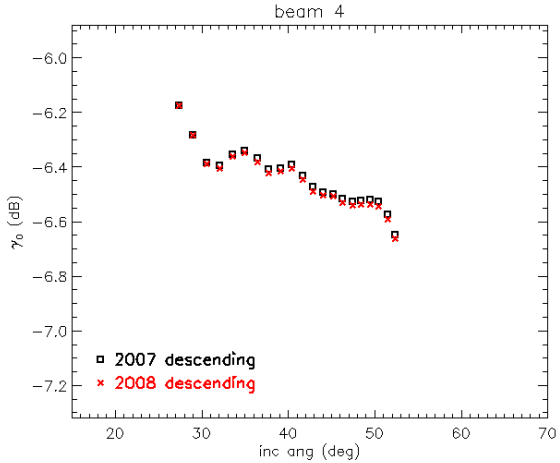
RAIN FOREST GAMMA ZERO DESCENDING PASSES: YEAR ON YEAR

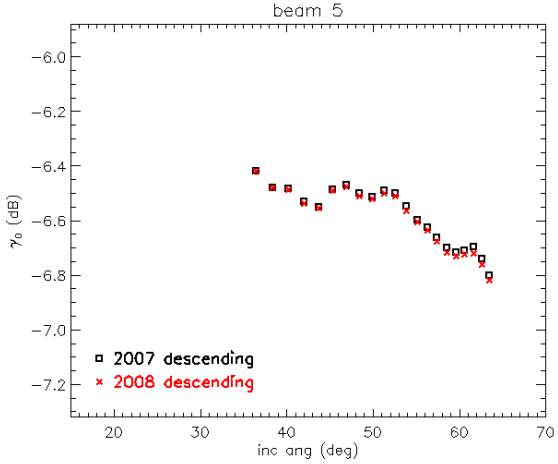




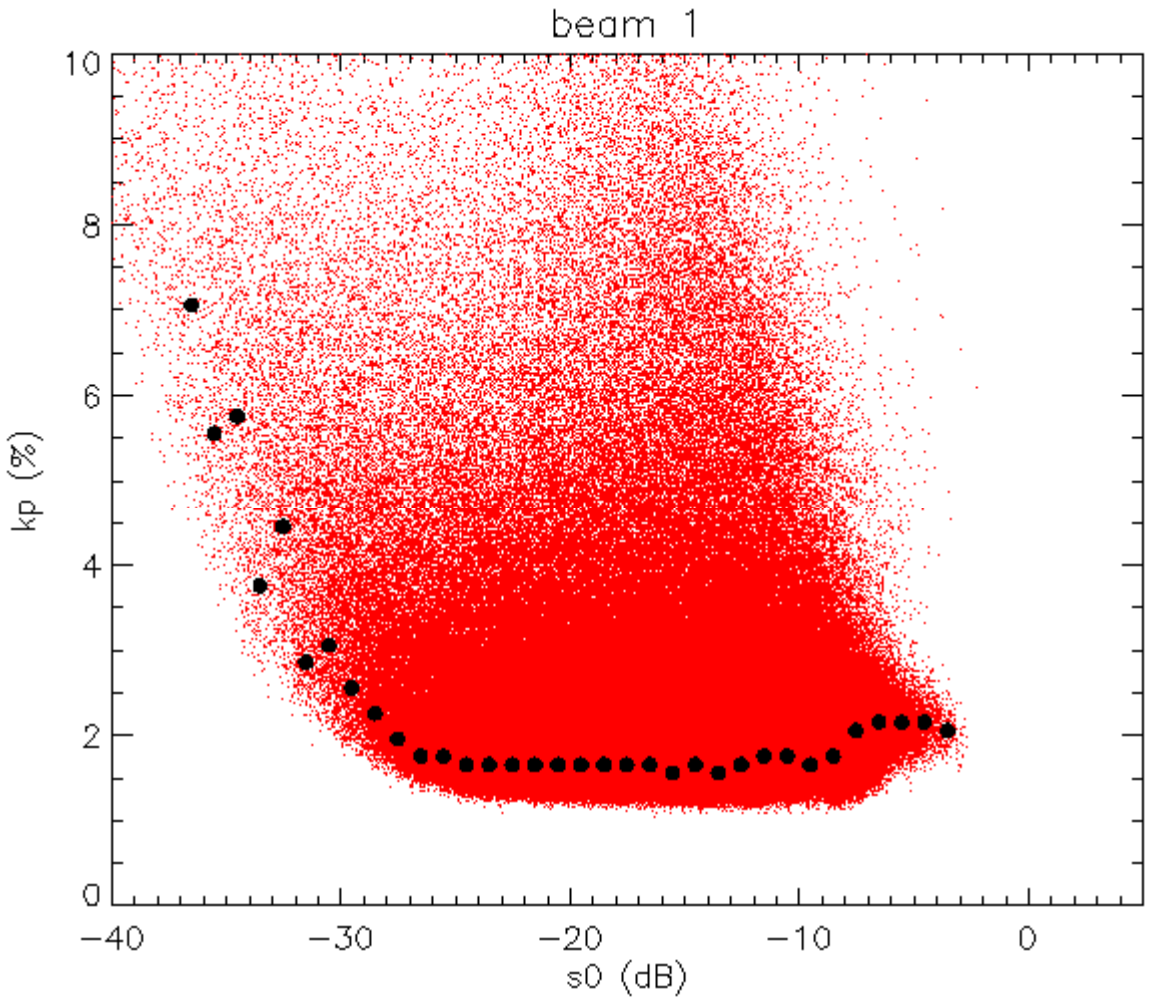








Kp (Approx.) versus Sigma Zero



One week / Left Mid

SUMMARY & RECOMMENDATIONS

- ASCAT is a very accurate and stable radar
- Make use of these characteristics to improve models / develop new applications
- Future Instrument Engineering Work:
  - Future Work on Kp: alg & stats.
  - Future Work on Rain Forest, Stable Ice & Ocean Calibration
  - Periodic Calibration Campaigns to monitor / correct antenna gain pattern aging if any
- Implications for Future Radar Wind Scatterometers