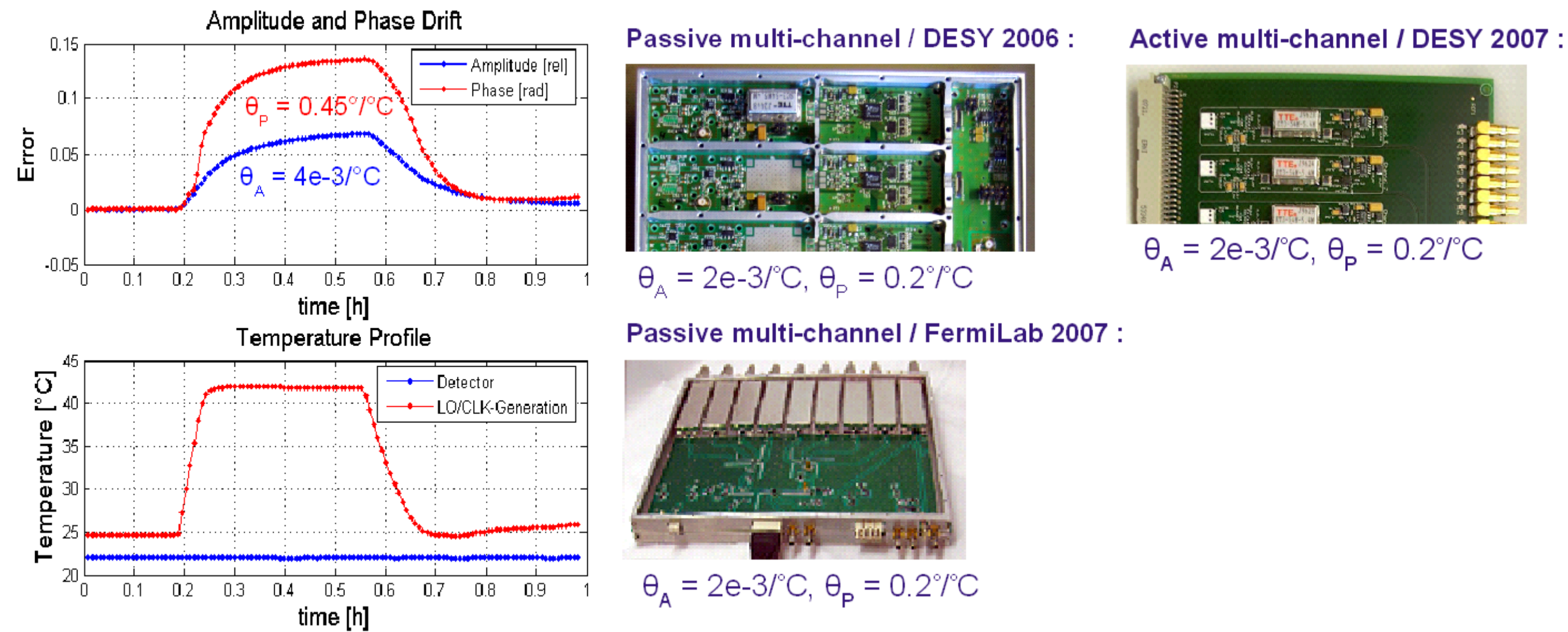


Drift Calibration Module for RF field detectors for FELs.

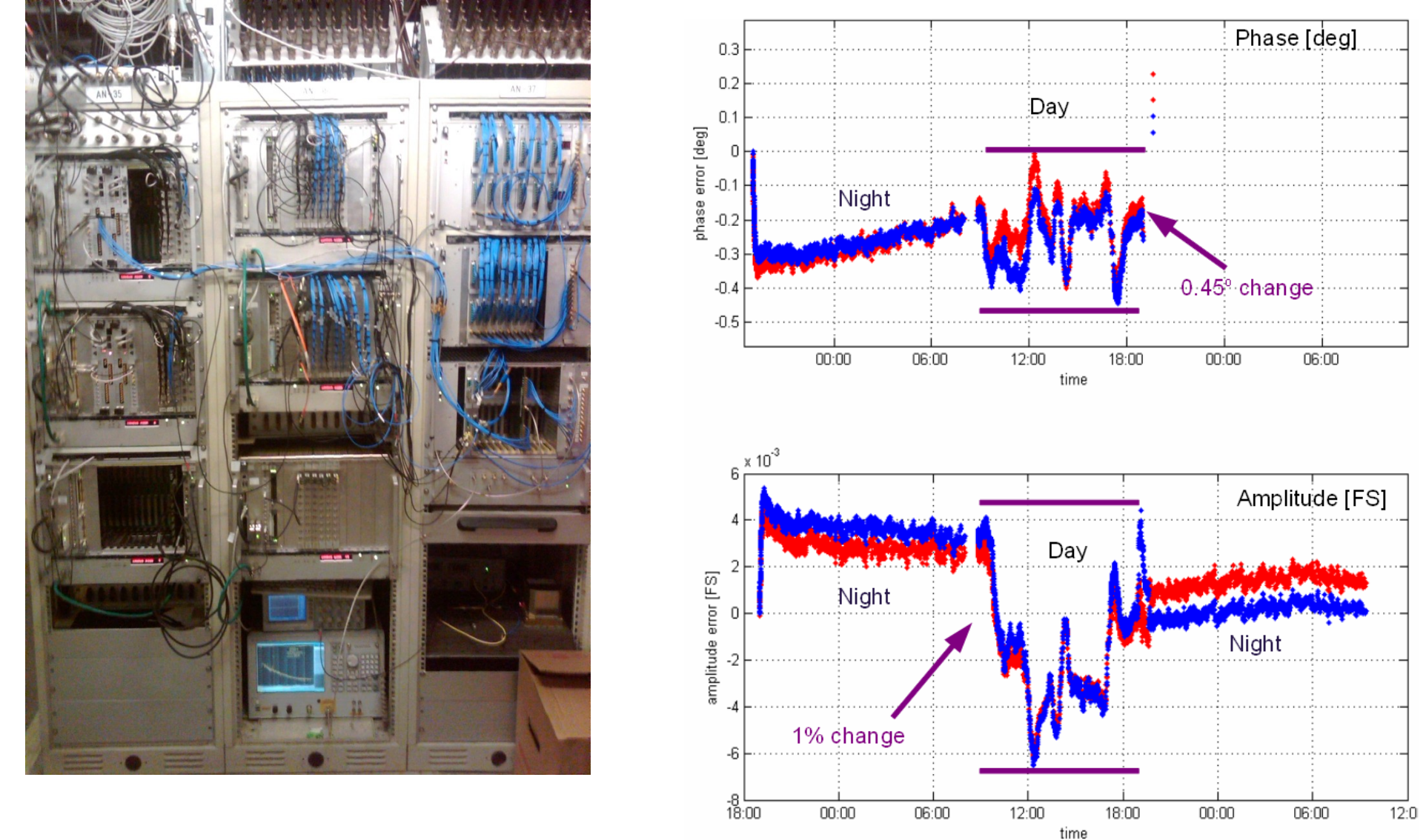


J. Piekarski, Ch. Gerth, K. Hacker, M. Hoffmann, W. Jalmuzna, F. Ludwig, G. Moeller, P. Morozov, H. Schlarb, C. Schmidt

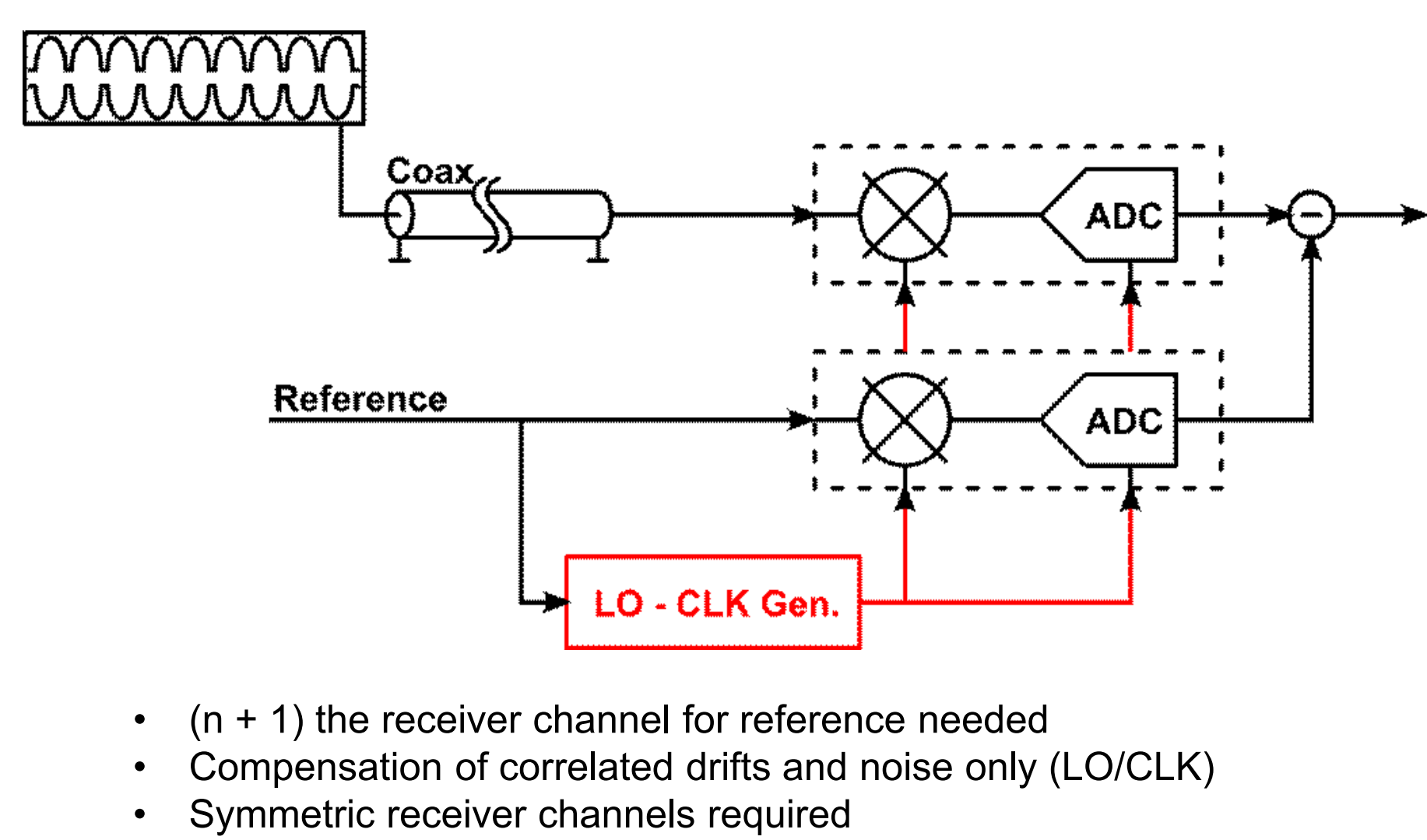
Drifts of LO Generation and Field Detectors



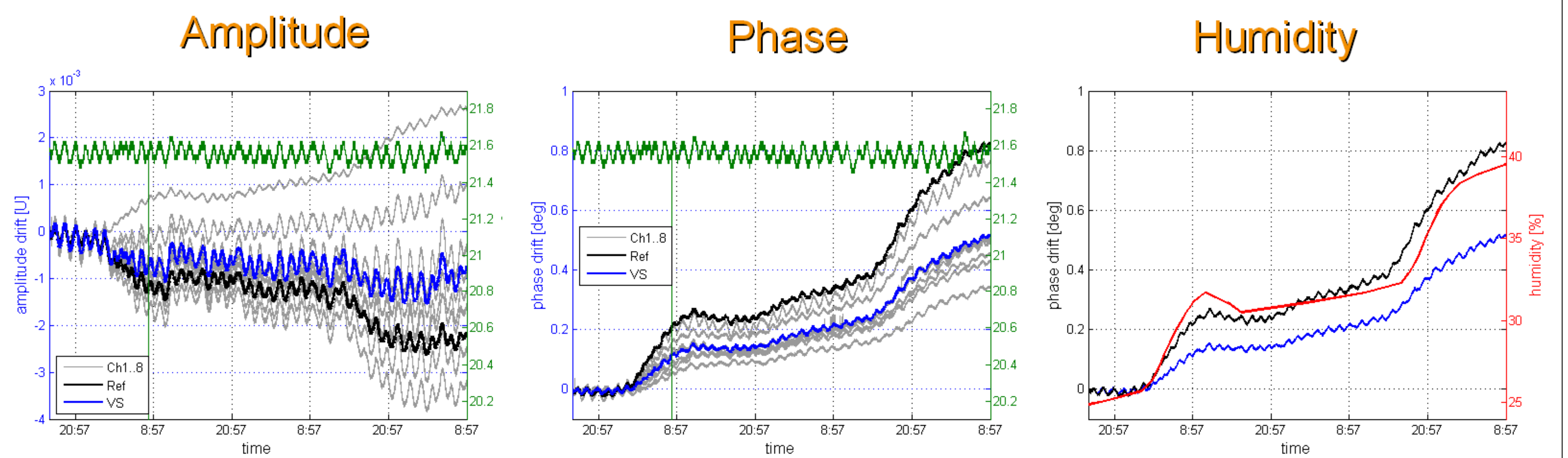
Temperature Changes (ACC456 Ext. Hall 3)



Principle of Reference Tracking

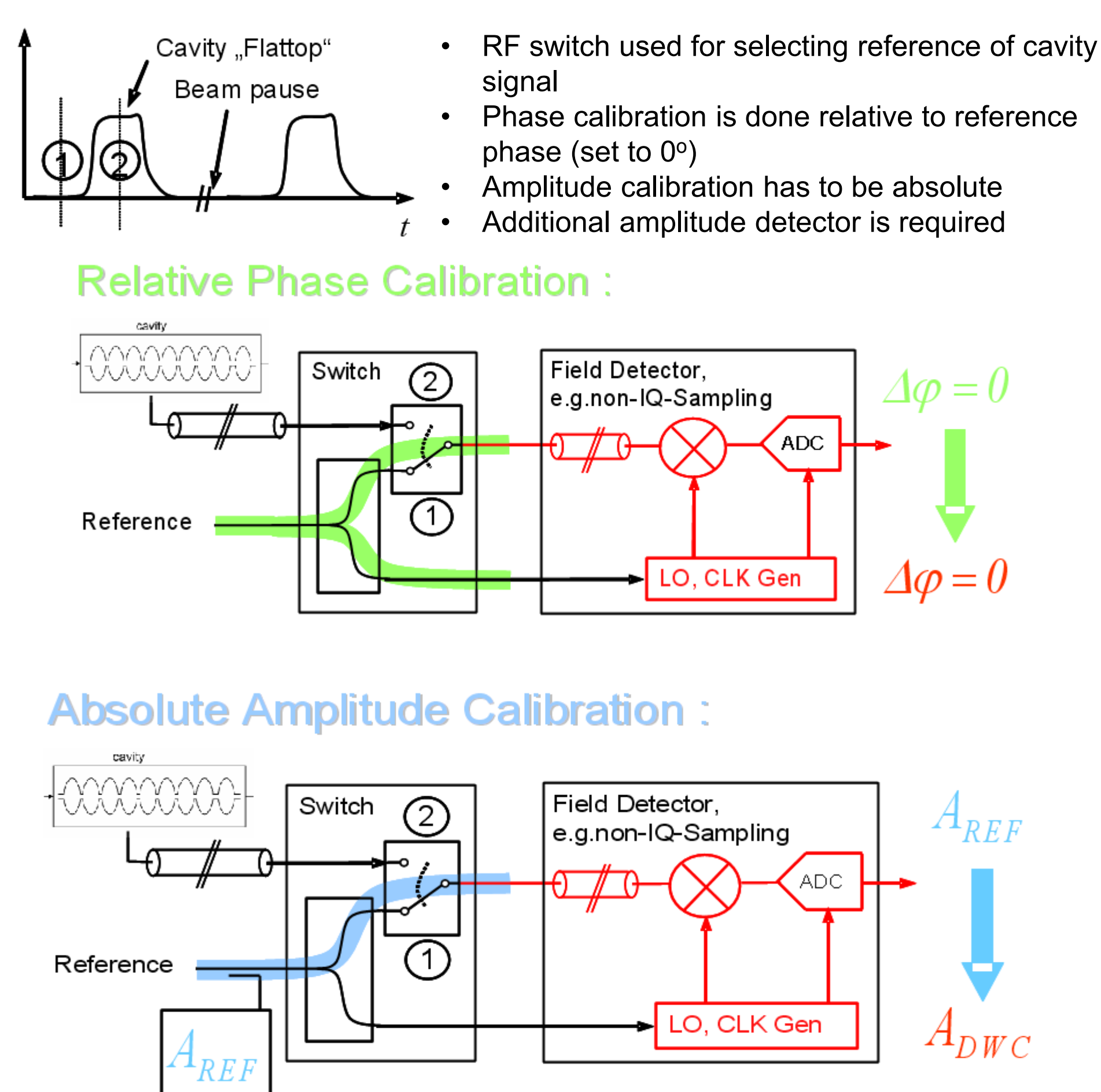


Measurement Results

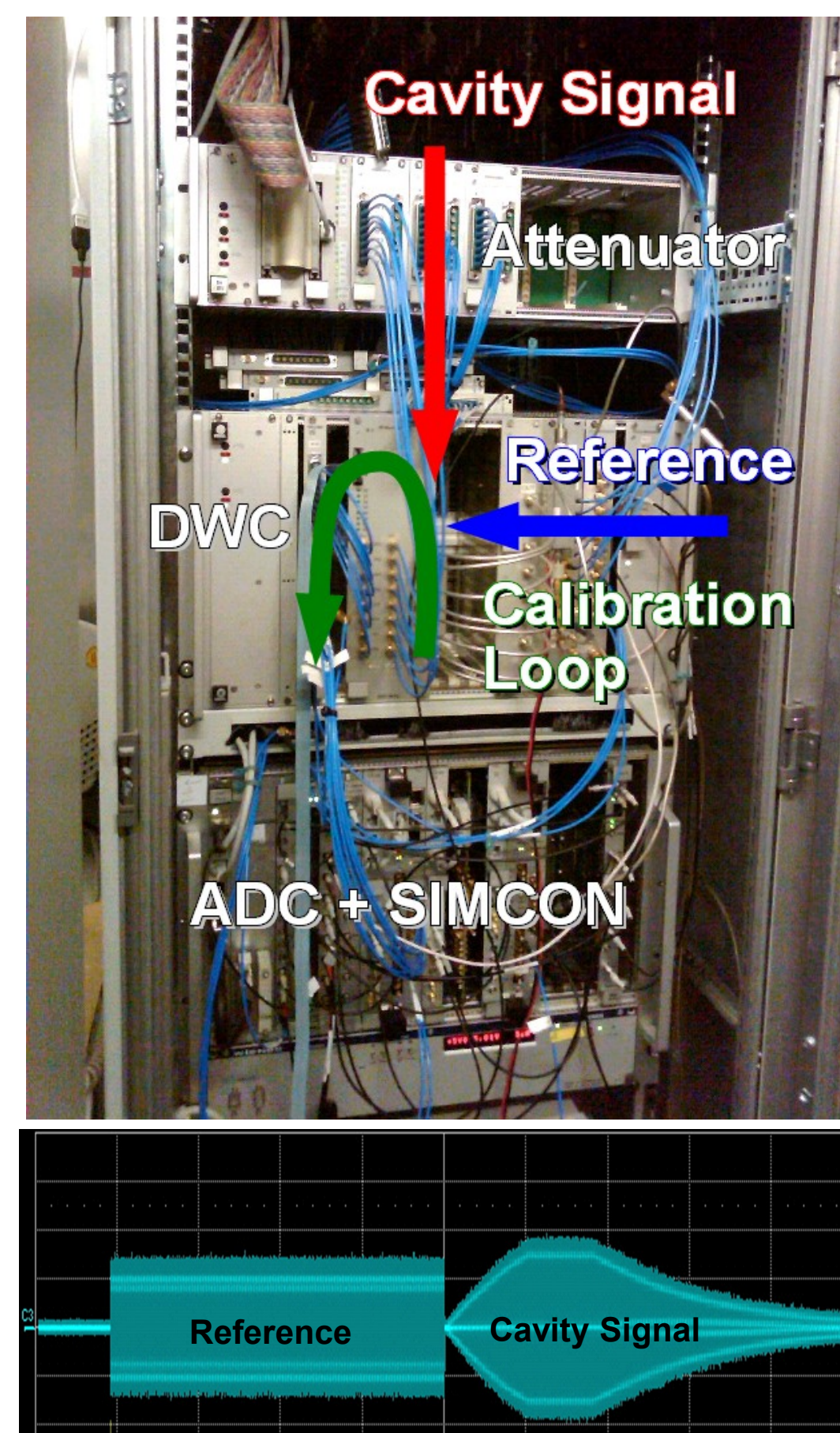


• Correlation between temperature, humidity, and amplitude and phase drifts

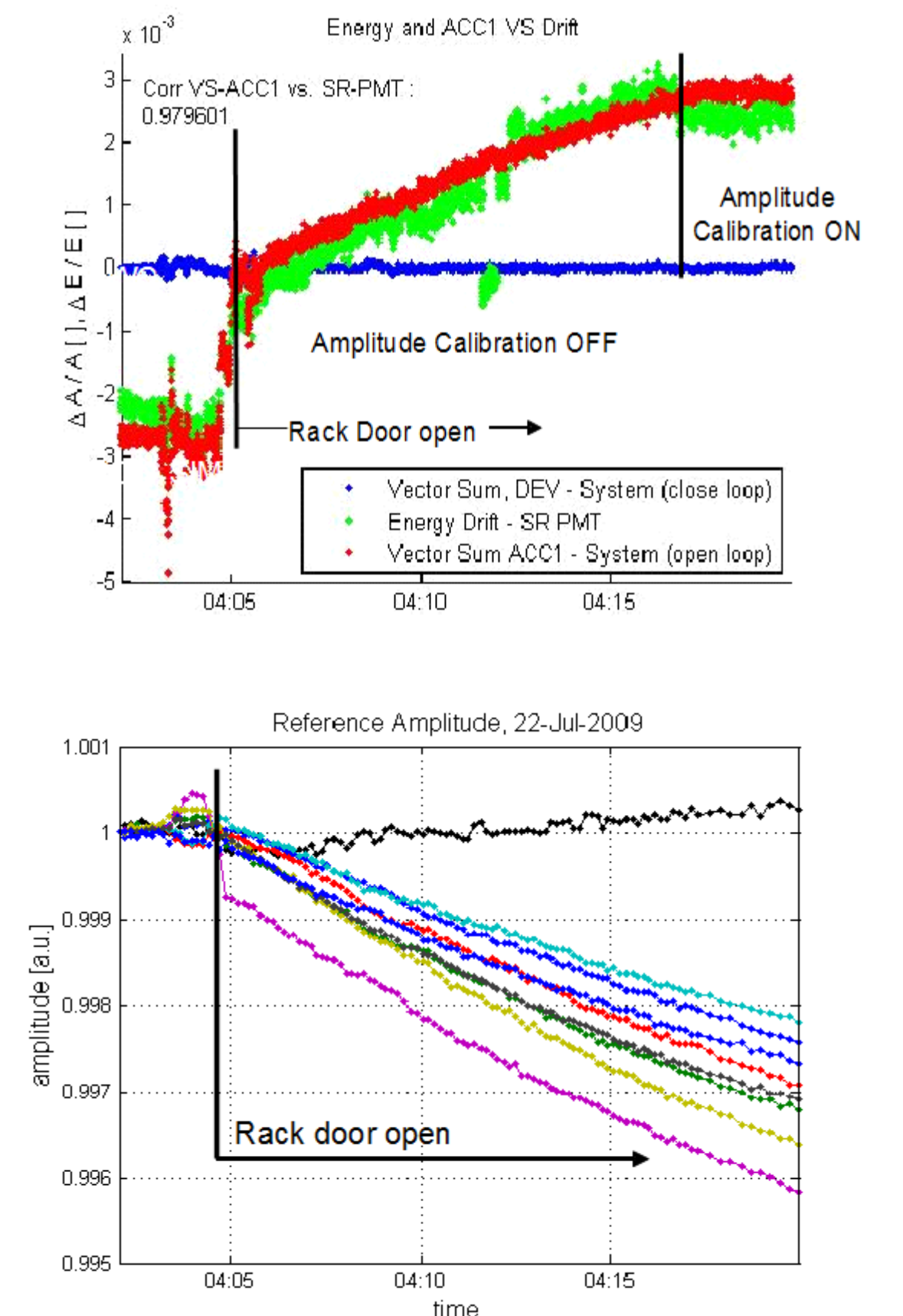
Principle of Reference Injection



Performance at FLASH:

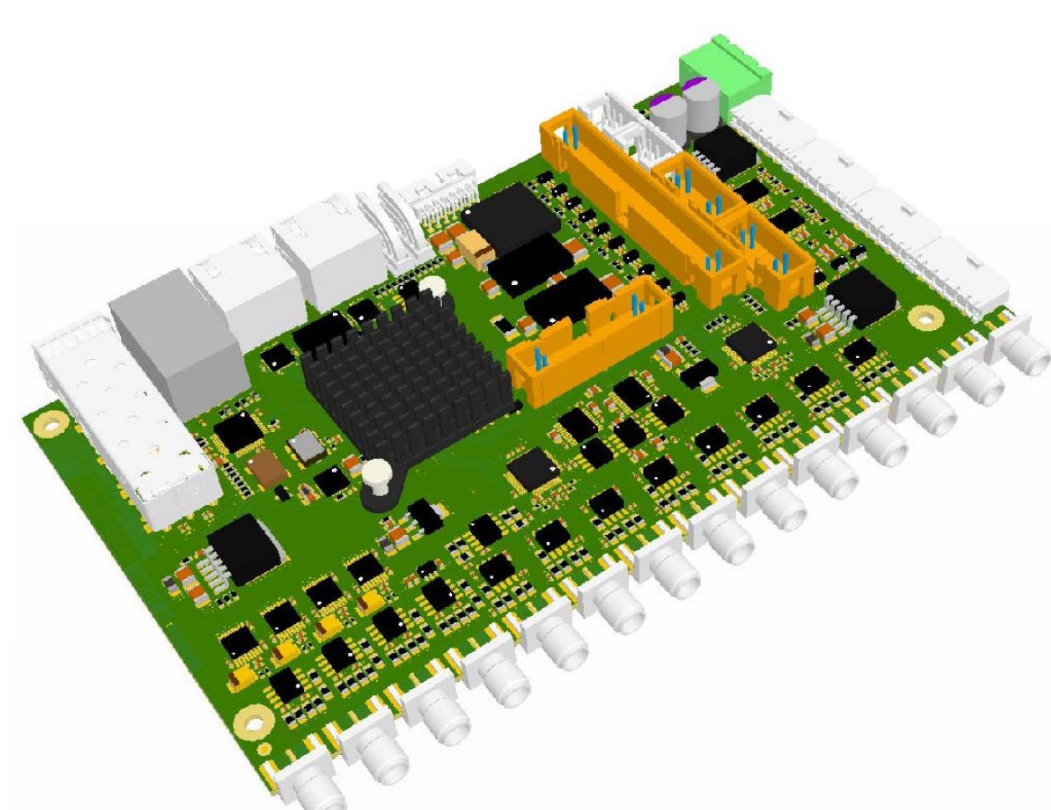


- Timing (switch controlled by SIMCON)
- Distribution of 1.3GHz reference (power splitter)
- RF switch isolation (>80dB)
- Development LLRF system used for feedback (closed loop)
- Apply adaptive feed forward on DEV to improve pulse to pulse stability
- Using ACC1-LLRF system as watchdog (open loop)
- Synchrotron radiation camera (SR-PMT) for measuring energy drifts
- Induce temperature change by opening rack door
- Correlation between ACC1 and SR-PMT 0.97
- Amplitude drifts dominate
- Unstabilized reference amplitude detection
- Uncalibrated components: Attenuators, external and rack cables, reference distribution

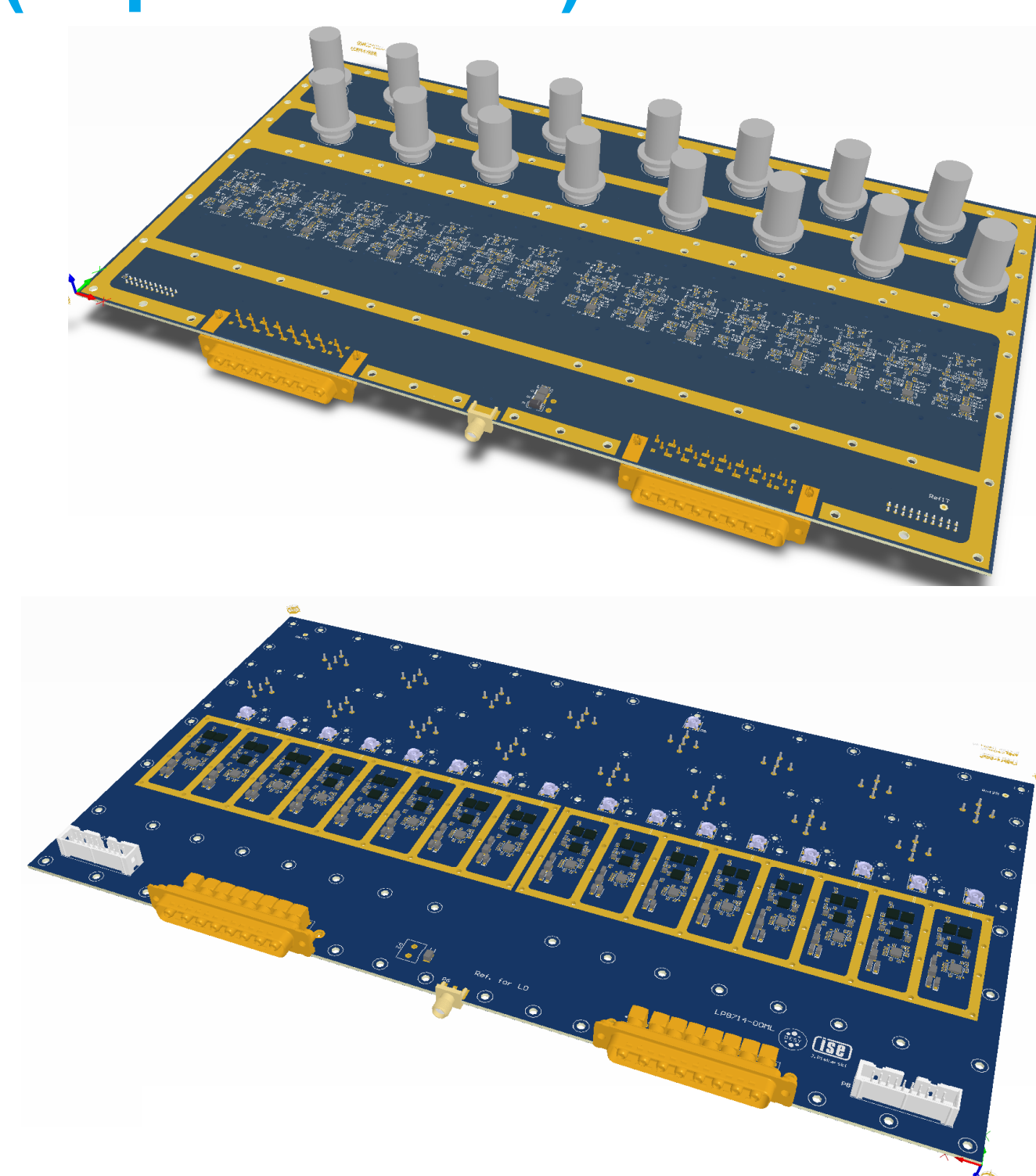


16 channel Drift Calibration Module (in production)

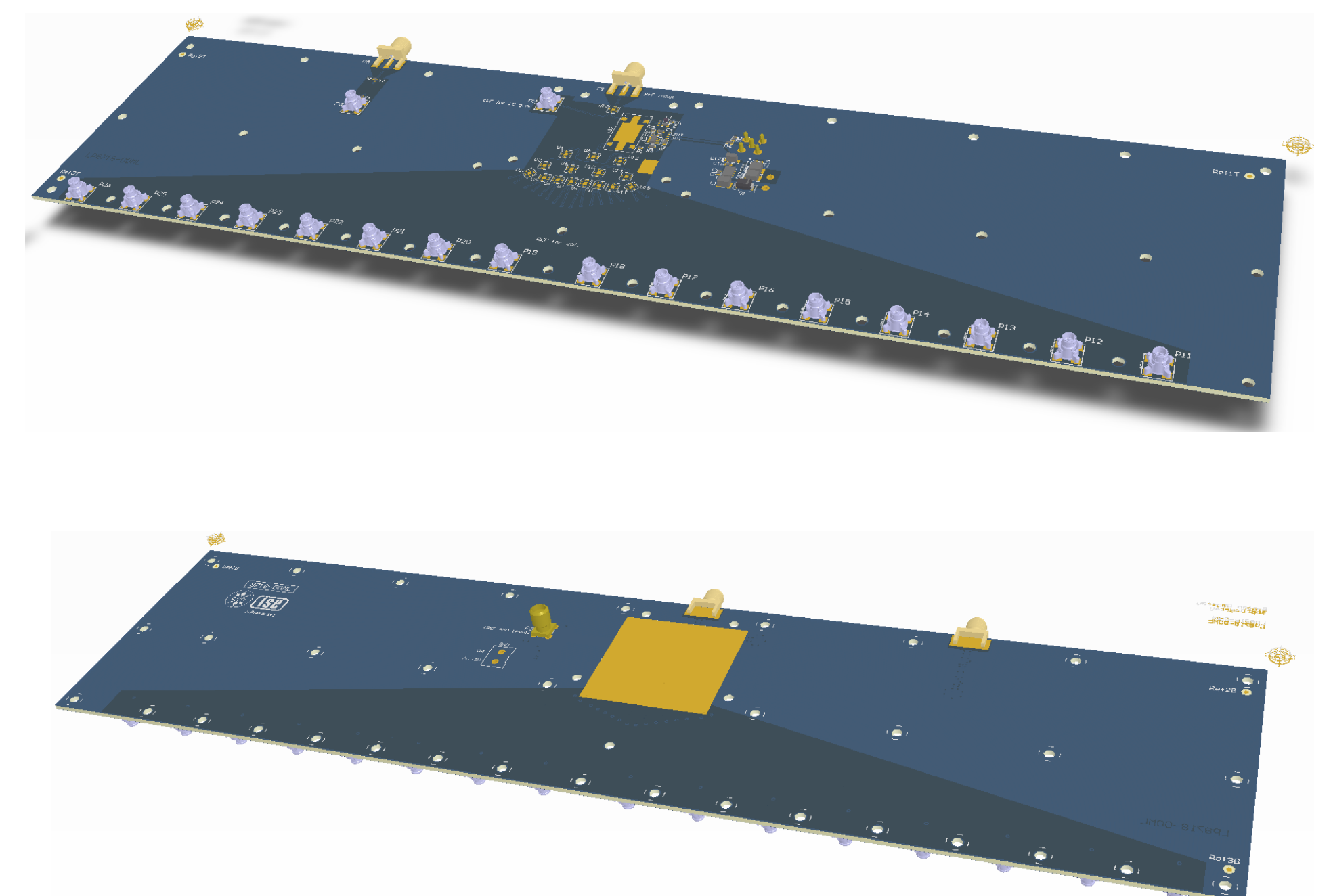
- Packaging: 19", 2 high units
- N-type RF input connectors
- 1.3GHz or 3.9GHz operation (different assembling)
- 1-16 reference distribution
- coupler with amplitude detector (temperature stabilized)
- Digital Controlled Attenuators for every channel



Temperature Monitoring & Control Board (designed by I-Tech)



Drift Calibration Module (Motherboard)



Drift Calibration Module (Amplitude Detector and Reference Distribution)

