Objective

Proof-of-concept study: Mount QFS compact AC induction sensor on Sky Research’s Helimag Sensor Platform for airborne UXO detection

Technical Approach

• Moving platform converts DC magnetic field distortion into AC signals
• Lower sensor noise (5 pT/rtHz) than Cs-magnetometer in the detection band
• Better discrimination capability due to 3-axis vector signature
• Motion induced noise minimized for sensor aligned to the Earth magnetic field

Results-In-Flight:

• Signal and motion induced noise are in the same band, ~ 0.5 - 3 Hz. Raw signal to noise ~ 0.3 for 100 lb bomb.
• With filtering large targets are visible SNR ~ 13; SNR is poor for small targets.

Conclusion

• QFS compact induction sensor in-flight noise ~ 20 nT/rtHz, Cs Vapor in-flight noise ~ 1 nT
• Mitigation of motion induced noise is required
• Post flight gradiometer experiment: 2 nT/rtHz achieved. Additional/alternative mitigation possible with angular rate sensors
• In flight noise of 0.1 nT/rtHz @1Hz is possible with mitigation and filtering