

# TM C3 Experiment – Advanced Environmental Capture

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**HOT Shot program enables TM to advance the TRL levels of critical new environmental capture technologies targeted for insertion in ANDI, the W87-0 JETU and the W87-1 EFTU.**

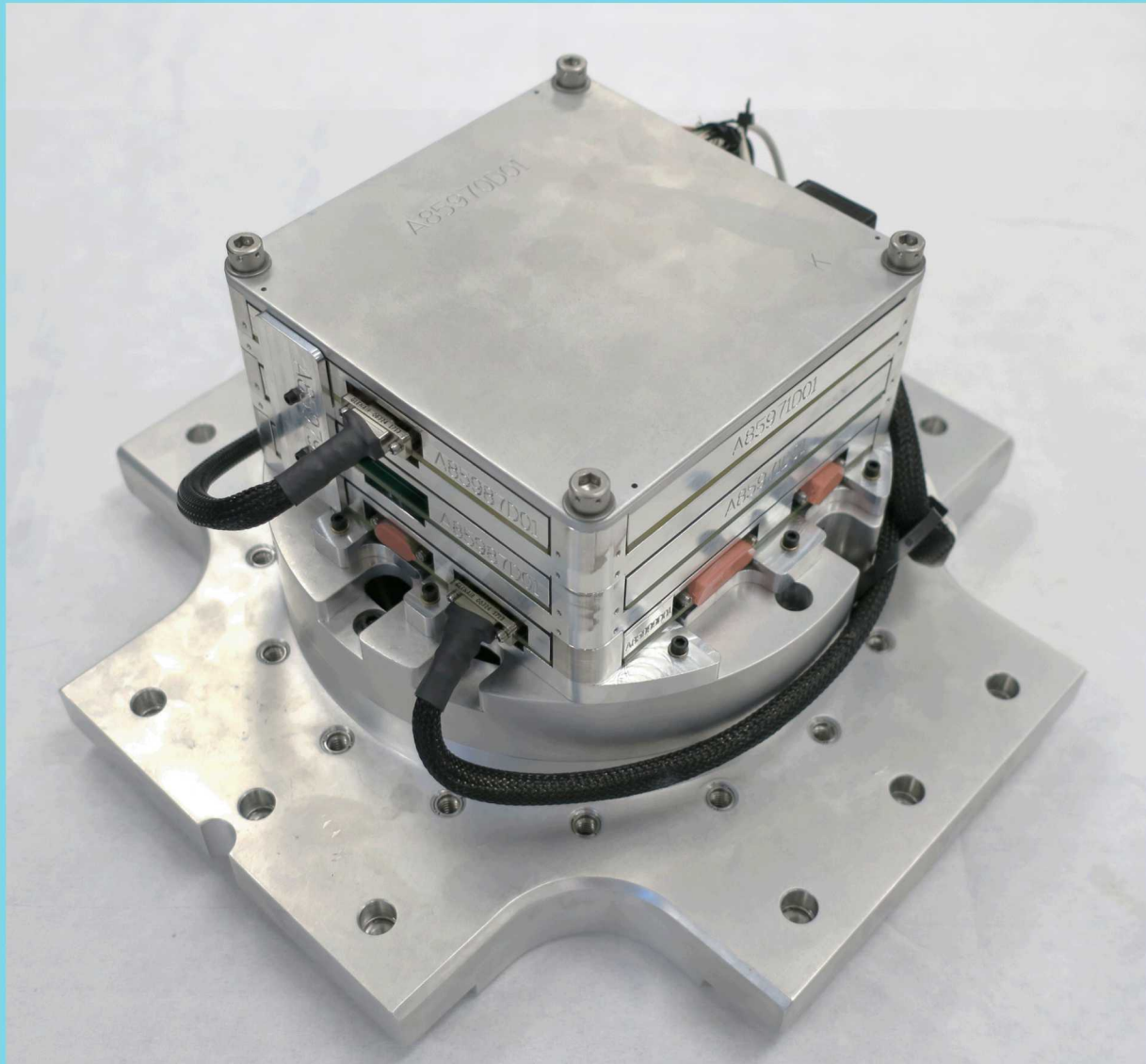
**Objective: achieve high confidence shock and vibration measurements in flight**

## Quick Look

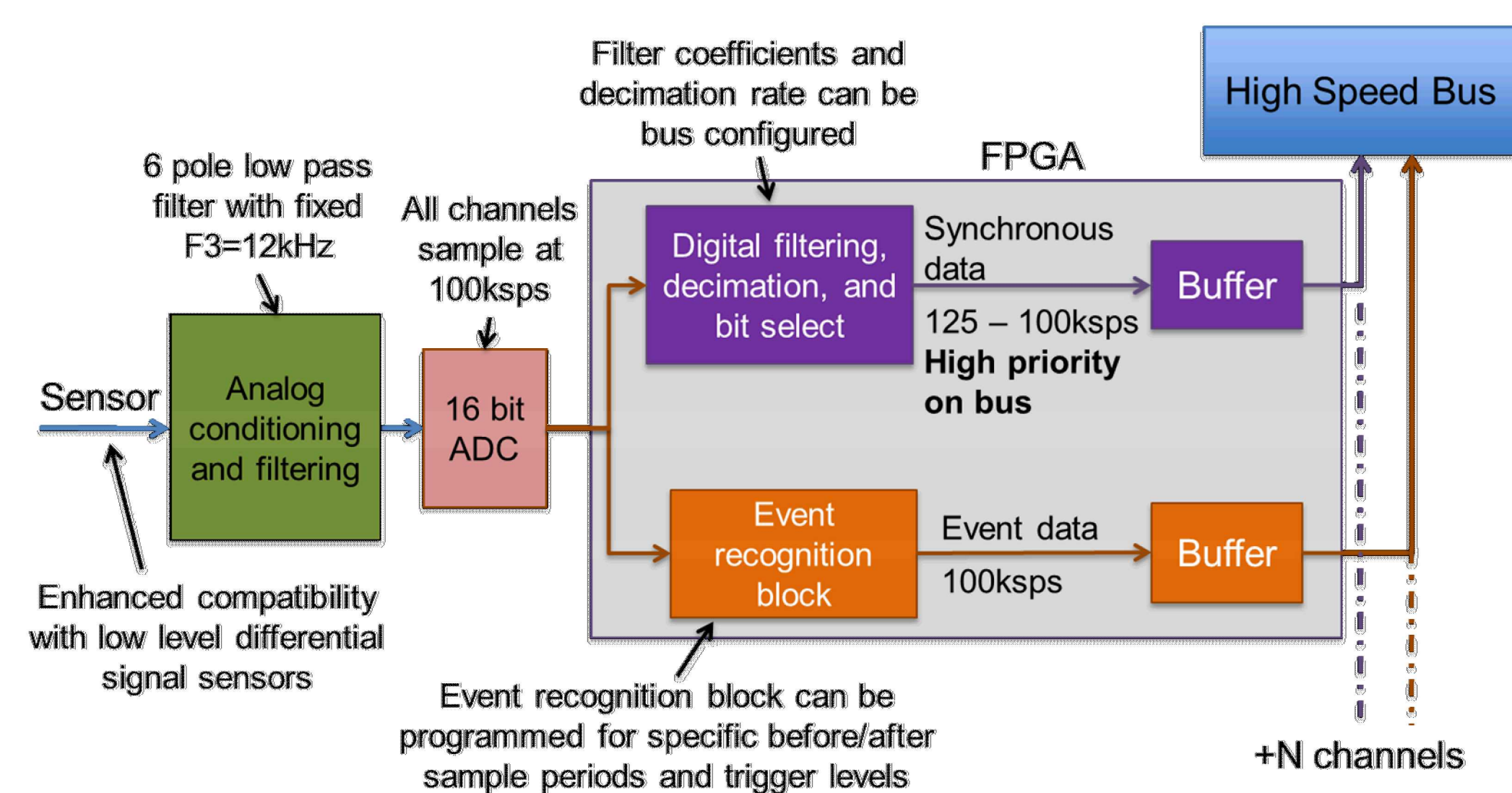
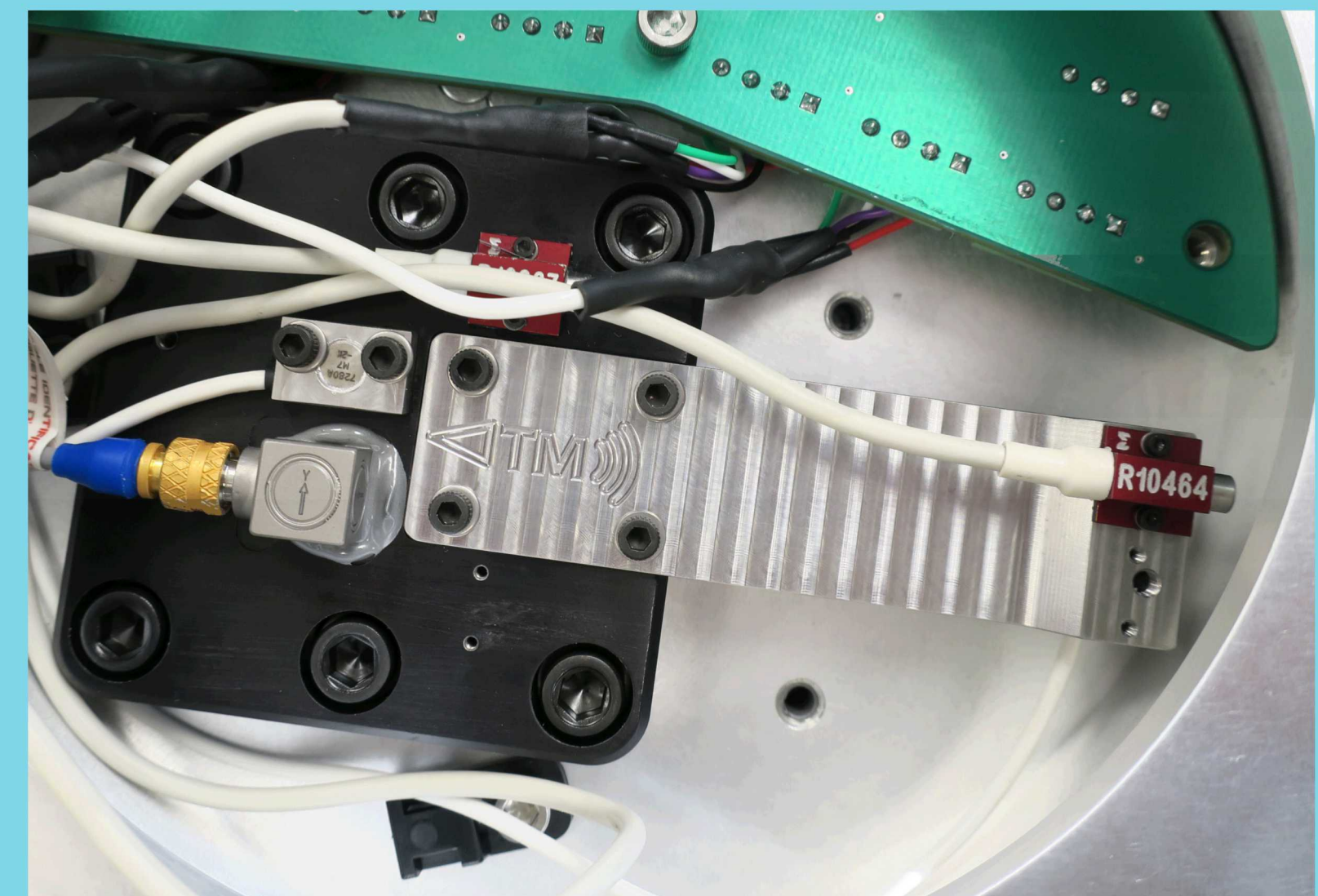
TRL before HOT Shot: 3

TRL after HOT Shot: 4

Program of Impact: ANDI

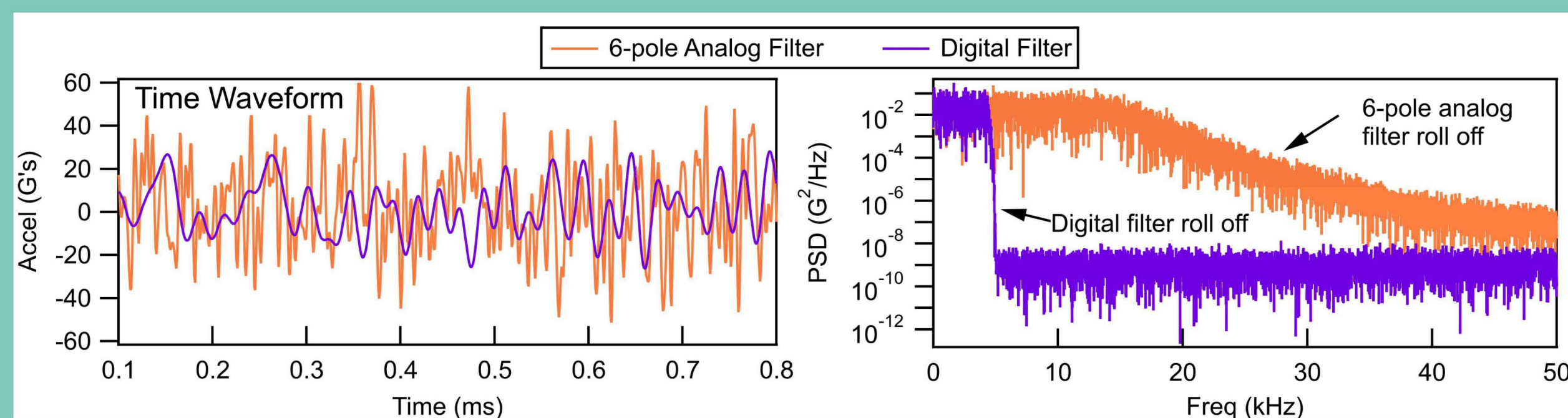


Program	C2	C3	C4	C5	ANDI
Gas damped sensors	✓	✓	✓		✓
Digital filter and decimation	✓	✓	✓		✓
Event capture	✓		✓		✓
Firmware based encryption			✓		✓
High Speed Bus		✓	✓	✓	✓
Isolated TDA				✓	✓
Burst transmission				✓	✓



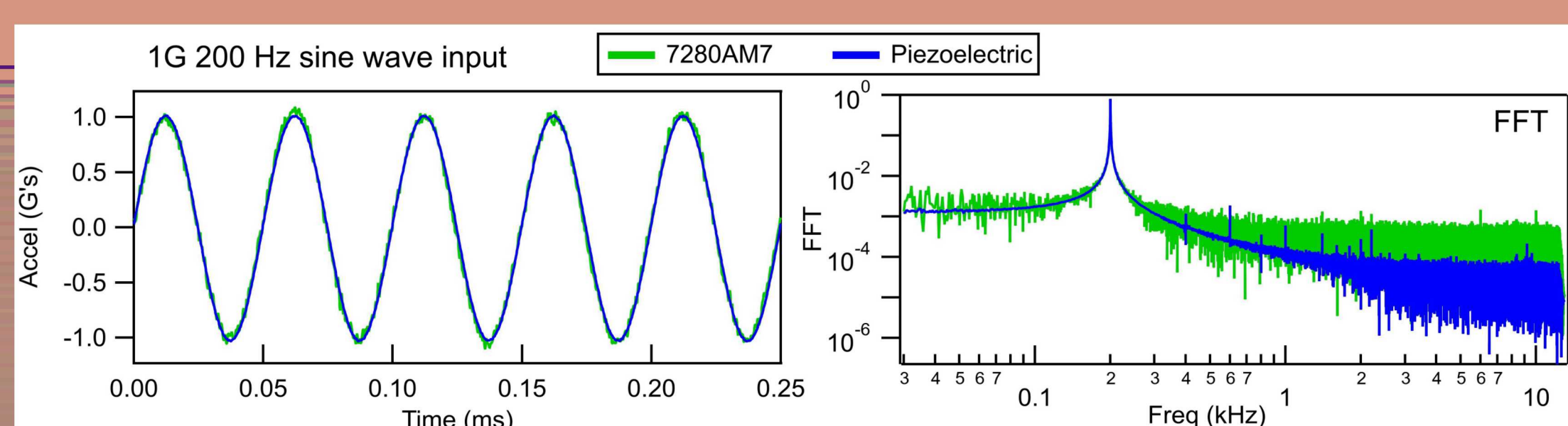
## Aliasing

- Solution: Oversample ADC, Digital Filter
- Advantages: Rapid roll-off, easily configurable



## Noise floor

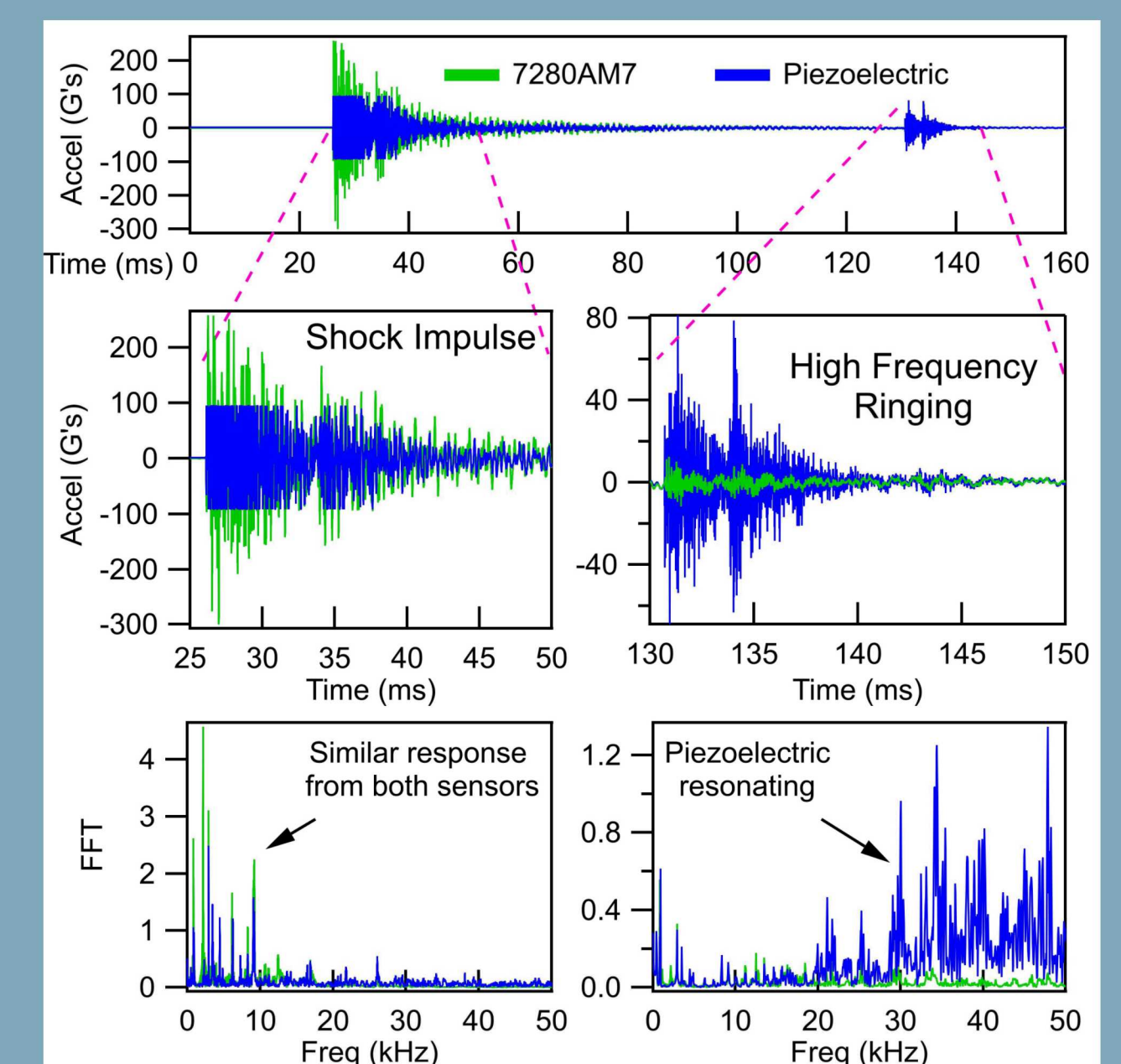
- Challenge: need high signal to noise ratio
- Proven on benchtop, need flight data to advance TRL



## Next Generation Sensor

	Endevco 65-10	Endevco 7280AM7
Range G's	100-500	2K
Sensitivity	10-50 mV/G	150 $\mu$ V/G
Resonance	>30kHz	>25kHz
Robust against resonance	✗	✓
Signal Measurement	Single Ended	Differential
Immune to Ground Loops	✗	✓
Noise floor less than 0.15Grms		
Lab testing	✓	✓
Flight test	?	?

Gas-damped piezo-resistive sensor with no resonance above 0dB



## Sample Capture Rate

- Solution: Spacewire
- Advantages: Higher capture rate during ground testing enables identification of otherwise hidden content

