



Air Force Research Laboratory



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High Rate Drop Tower Data Set

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Objective



- **This data set will be shared with academic collaborators to provide relevant high-rate data for development of algorithms**



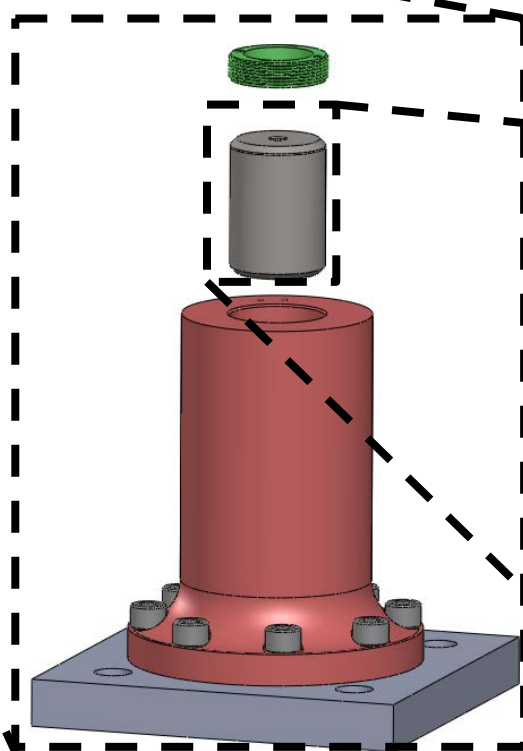
Summary of Test Setup

a) drop tower; b) mounting fixture; c) electronics package

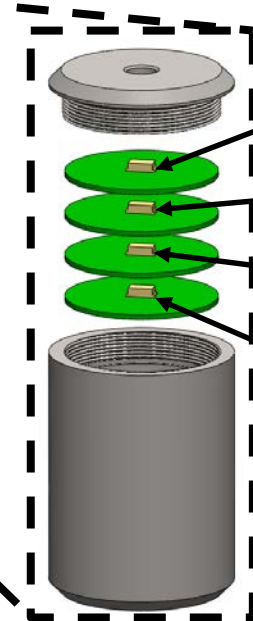
An electronics package with accelerometers on each unpopulated board was mounted in an axial fixture and held in place with a **single** lock ring torqued at 25ft-lbs.



(a)



(b)



(c)

accel 4

accel 3

accel 2

accel 1



Axial Fixture Mounted to MTS

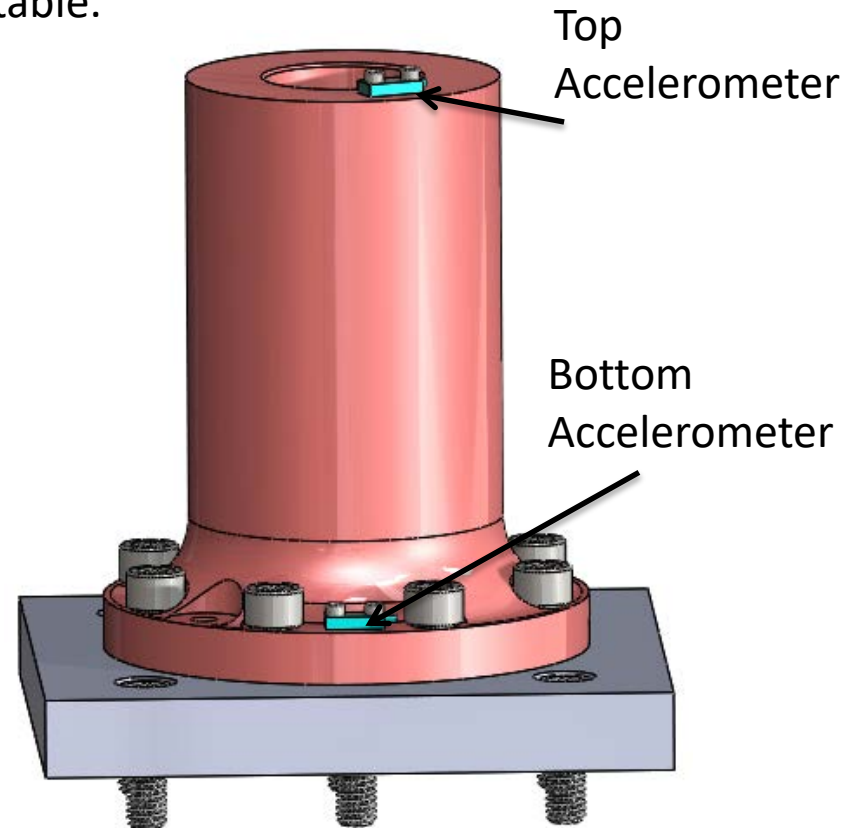


The axial fixture was bolted to the MTS drop tower table adapter plate using 3/8-16 – 1" bolts.

The drop tower table was dropped at heights of 20" and 72". Mitigating material was used between the drop tower table and the seismic mass to control the pulse shape.

The axial fixture is instrumented with a bottom accelerometer (an Endevco 7280A-60k) and a top accelerometer (an Endevco 7270A-60k) to measure the input into the fixture.

Axial fixture mounted on MTS drop tower table adapter plate which in turn is mounted on the drop tower table.





Test Matrix for Electronics Package



- Two different impact conditions were tested (series 1 and 2)
- The following table described the test conditions:

Series	Mitigator (between table and seismic mass)	Height
1	1/16" F1 felt	20"
2	1/2" F1 felt	72"

- The two external accelerometers as well as the four embedded accelerometers were measured.
- Data was measured at 1MS/s with a 204.6kHz anti-aliasing filter and digitized using a 12-bit ADC.

The units for the accels are in KGs. The sampling frequency is 1 MHz. Use below to create time vector:

```
N = length(accel1);  
fs = 1e6;  
dt = 1/Fs;  
time = 0:dt:(N-1)*dt;
```



Information about data

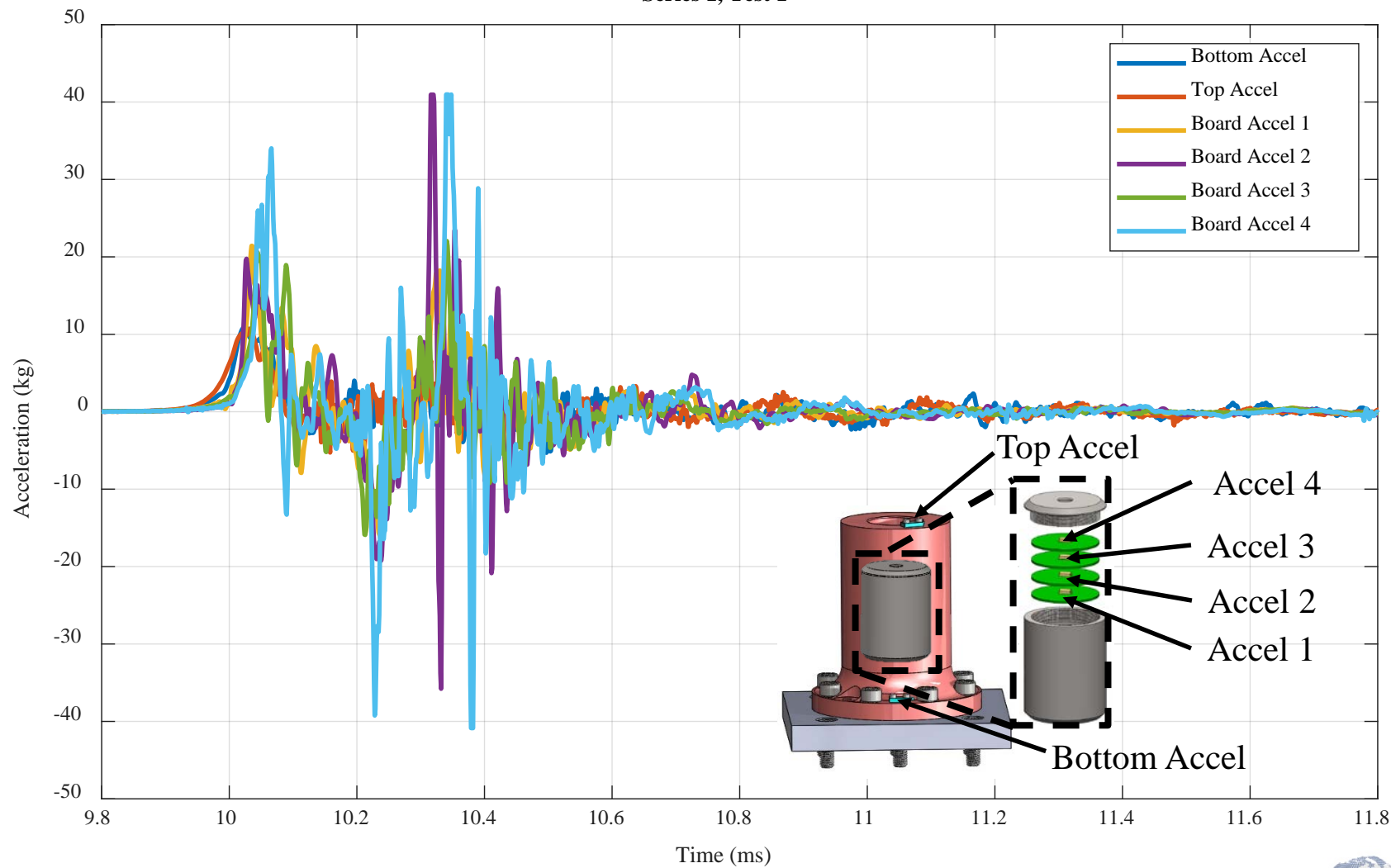


- **Filename = 'Series number'_'test number'**
- **Data = [external bottom accel (kg), external top accel (kg), board 1 (kg), board 2 (kg), board 3 (kg), board 4 (kg), time (ms)]**



Test Data

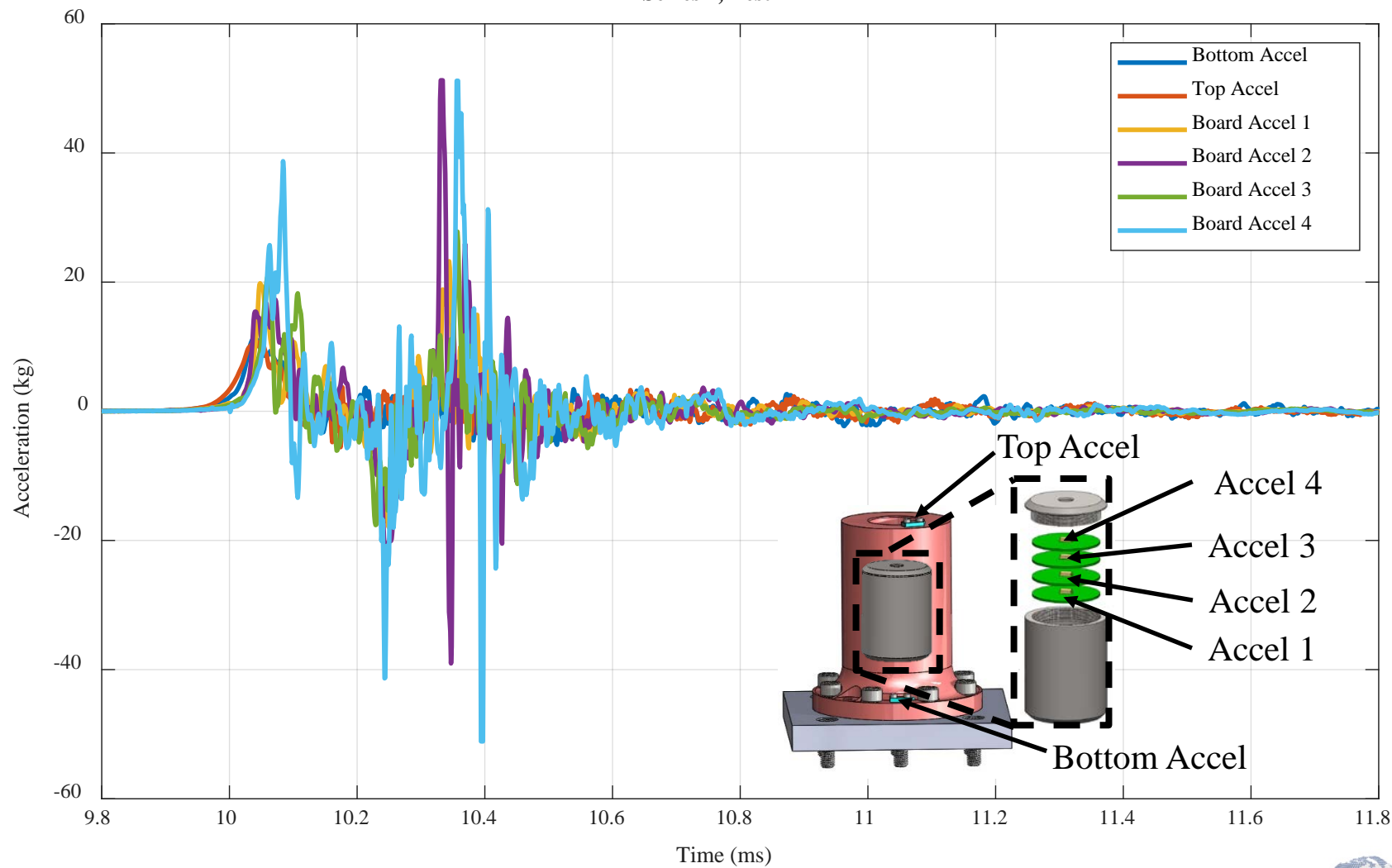
Series 1, Test 1





Test Data

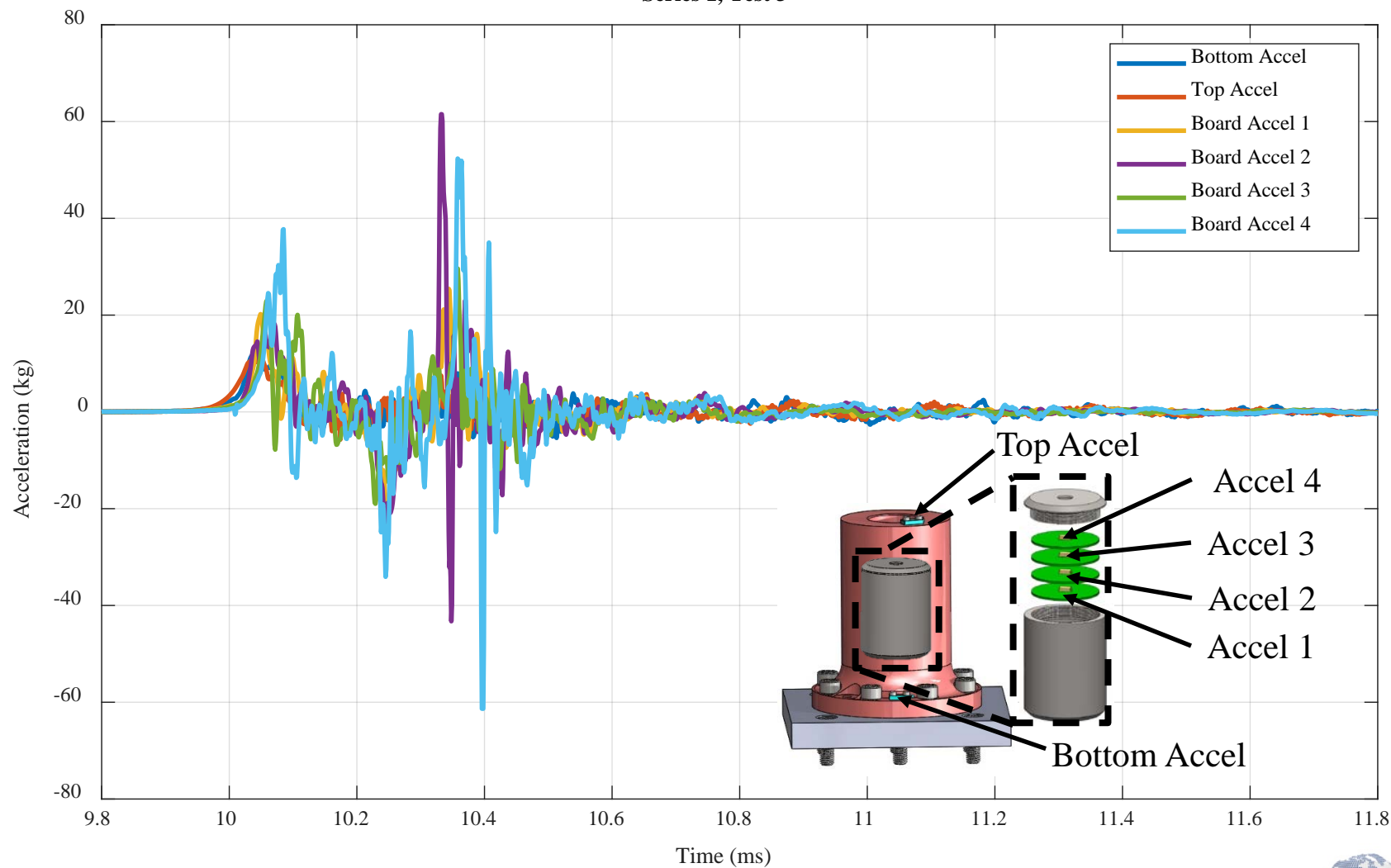
Series 1, Test 2





Test Data

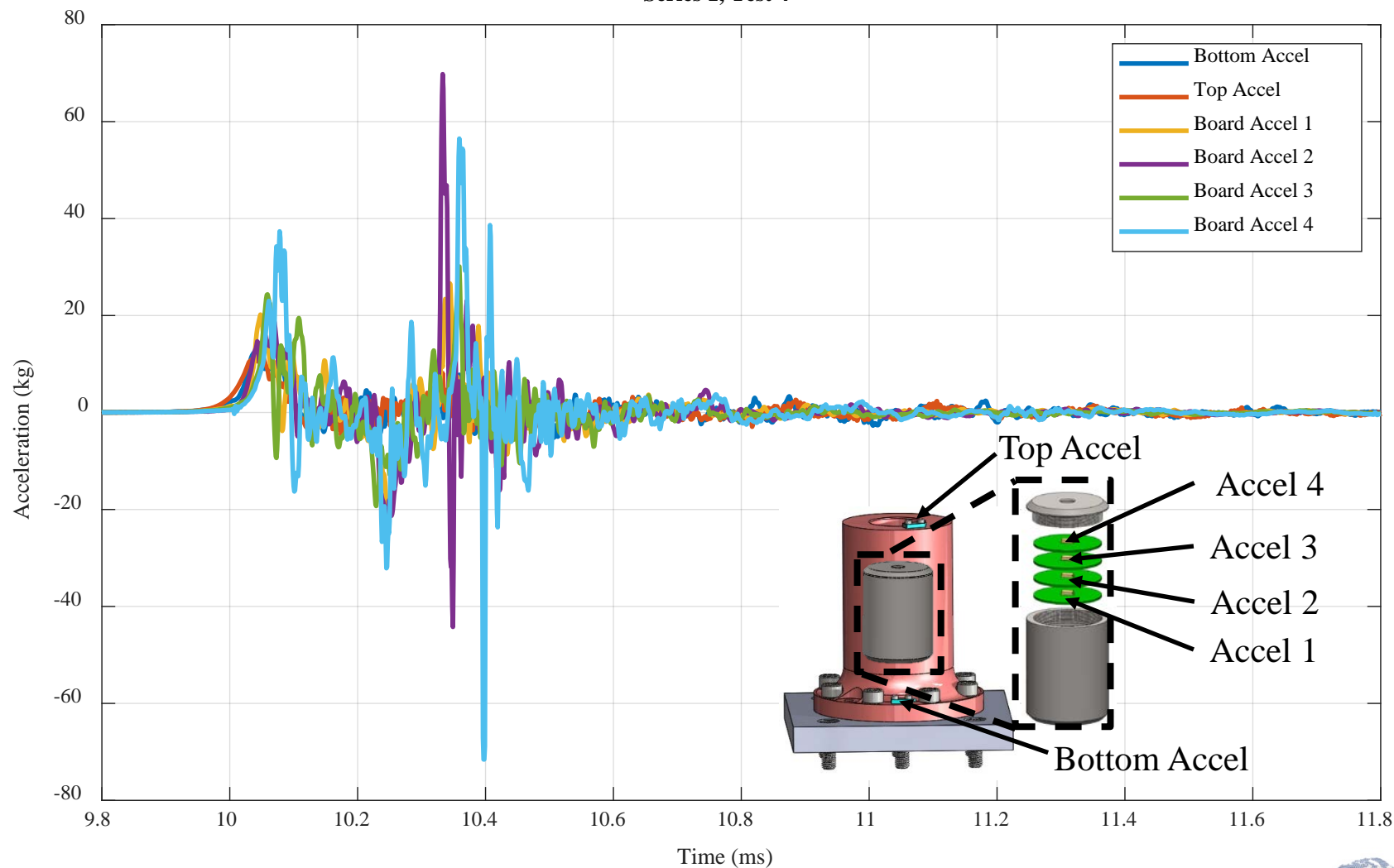
Series 1, Test 3





Test Data

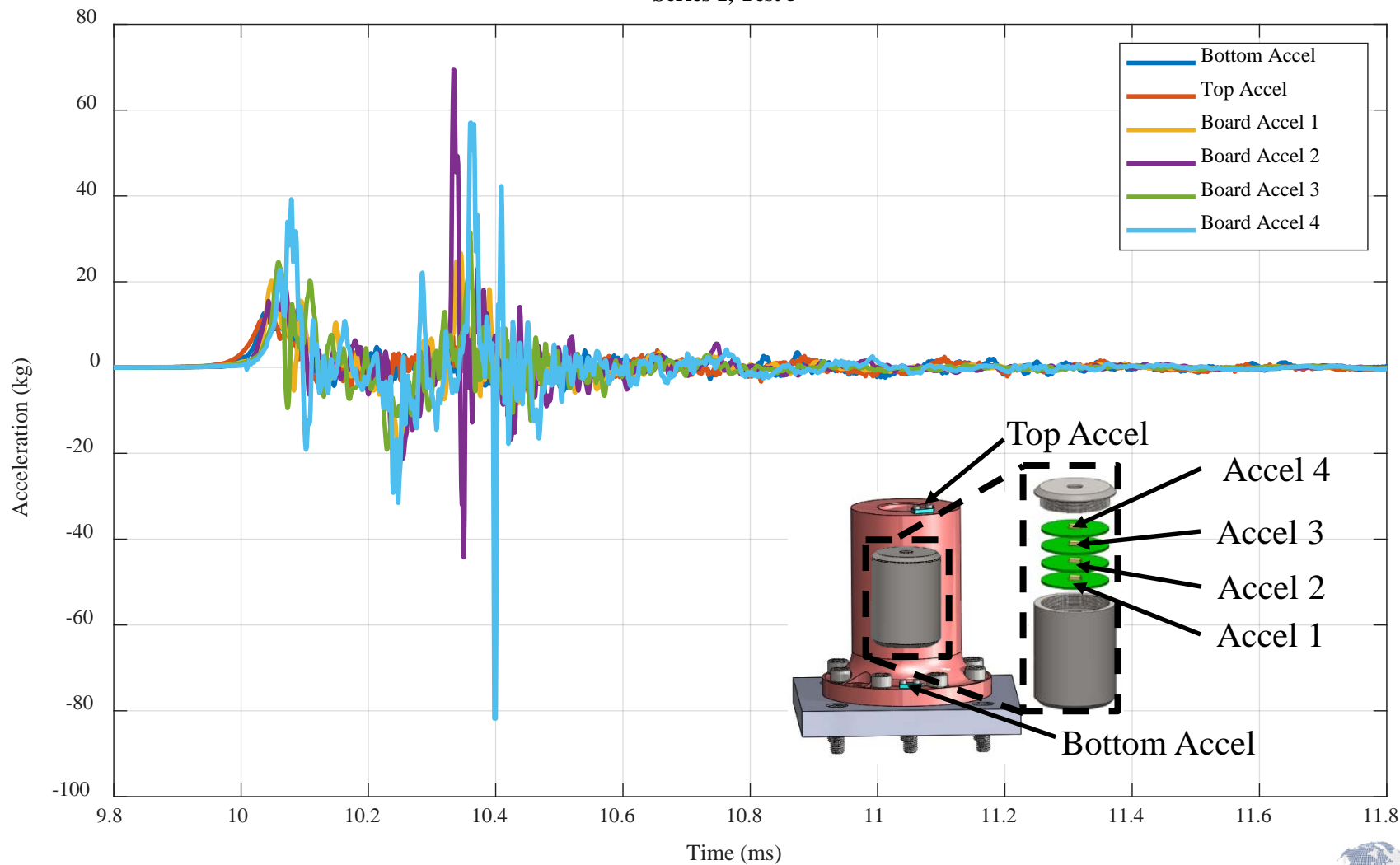
Series 1, Test 4





Test Data

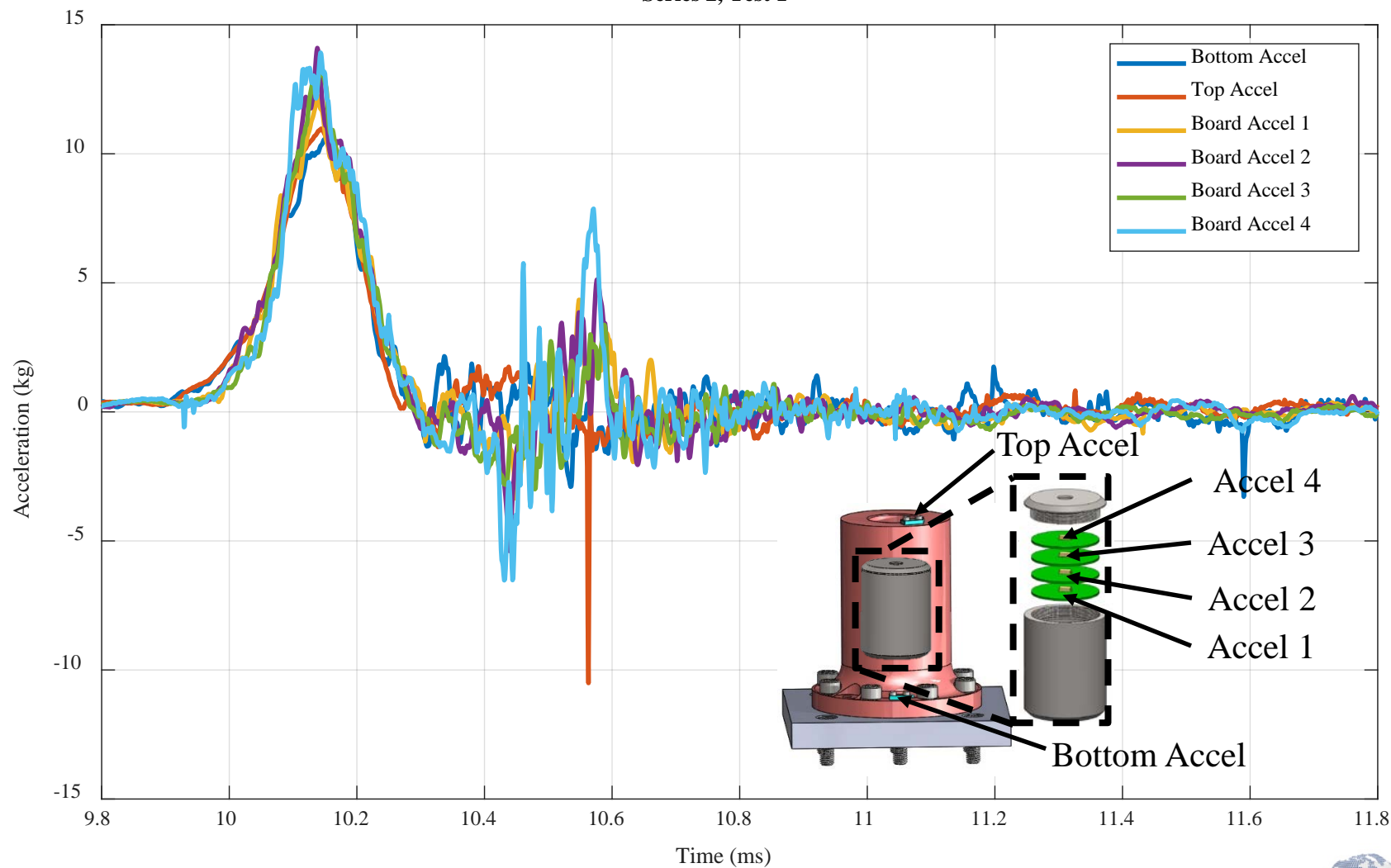
Series 1, Test 5





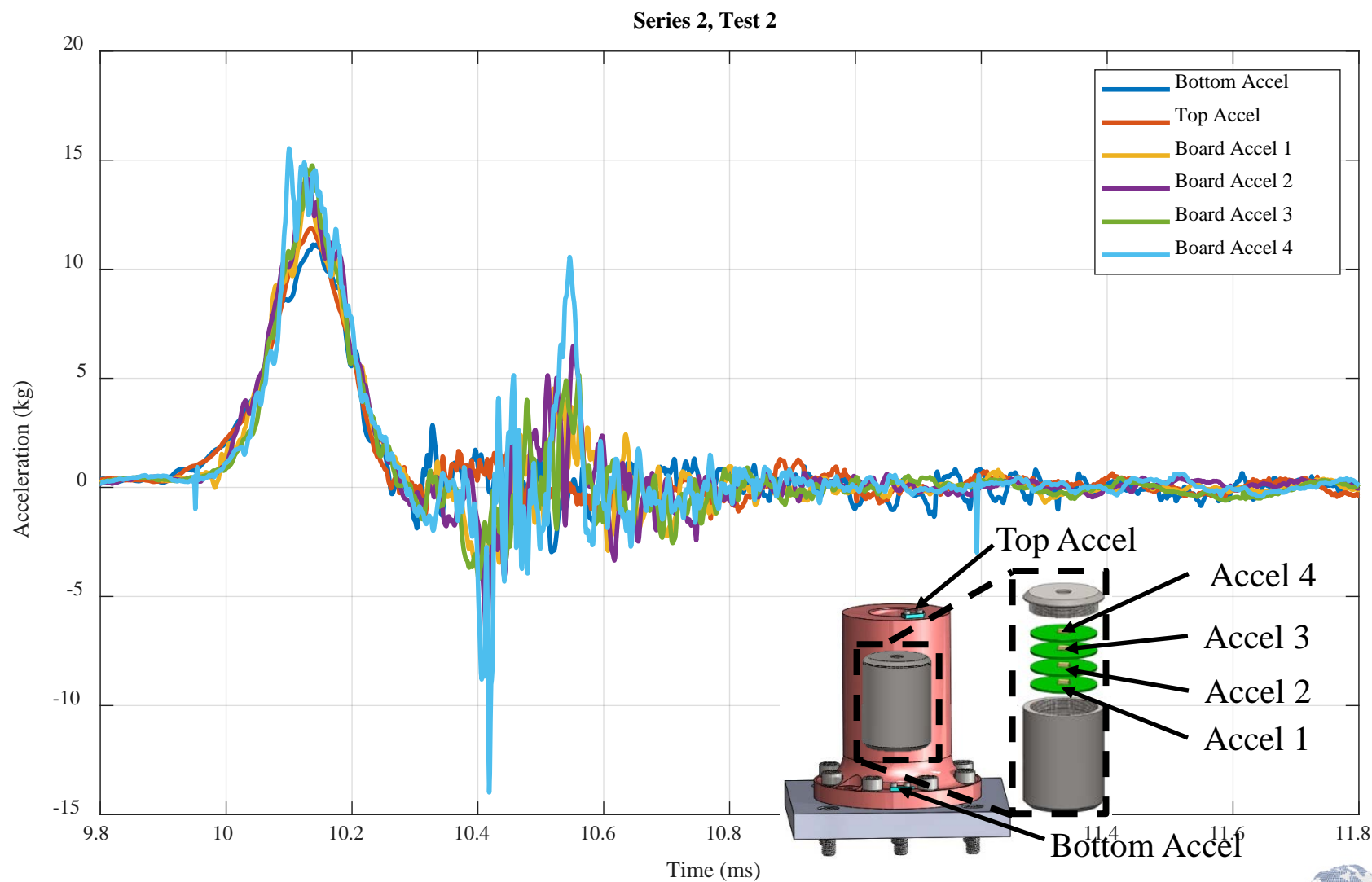
Test Data

Series 2, Test 1





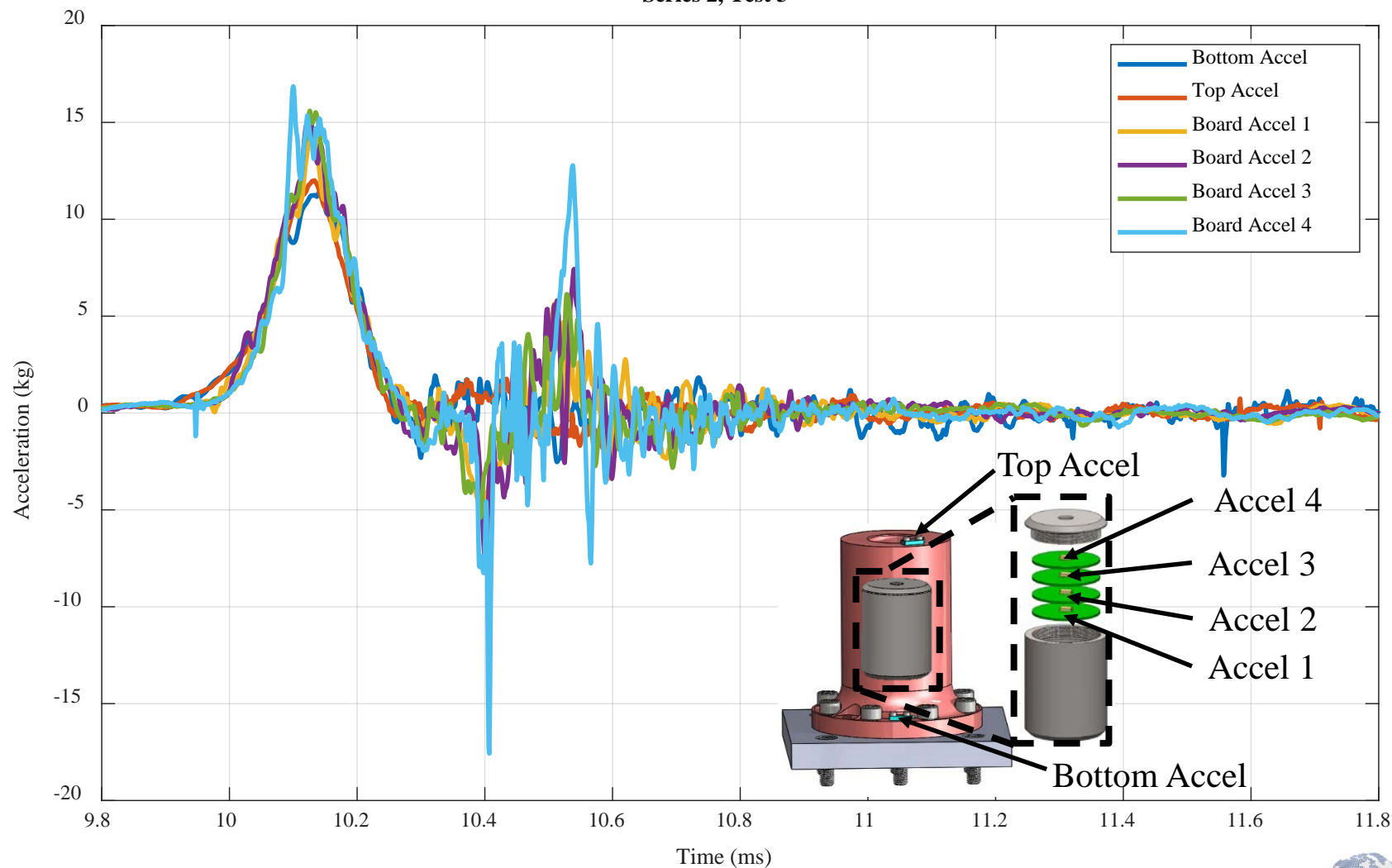
Test Data





Test Data

Series 2, Test 3





Test Data

Series 2, Test 4

