Analysis of Accelerometer Data

Yunjie Yang

September 12, 2017

Contents

1 Histograms **2**

2 Biggest Shocks **3**

2.1 Box front 4

2.2 Box back 5

2.3 Inner front 7

2.4 Inner back 8

2.5 Outer front 10

2.6 Outer back 11

2.7 Floor 13

1 Histograms

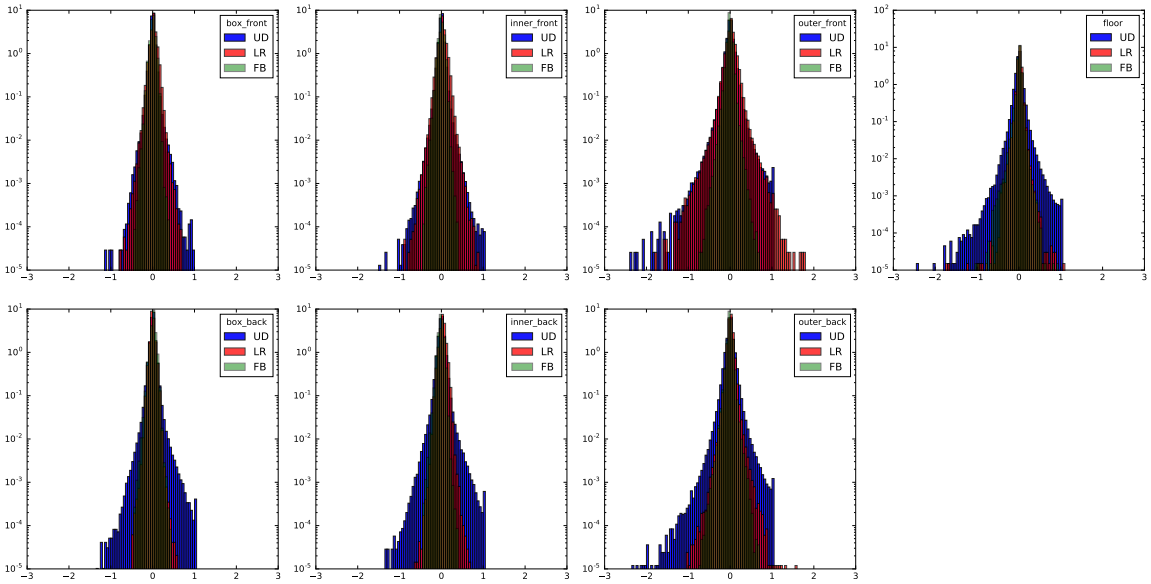

Figure 1: Histogram of all sensors during the dry run.

2 Biggest Shocks

I list all the biggest shocks observed during the dry run for each direction for each sensor in Table 1. The corresponding plots are shown in the subsections of this section. The plots show all the accelerometers (all 3 directions) in a ±5s window when one channel of one accelerometer experienced the largest shock (think of it as a "trigger").

Sensor	Direction	Time	Might be happening
box_front	UD	16:27:48	rumble strips
	LR	16:29:31	rumble strips
	FB	15:42:19	
box_back	UD	16:27:48	rumble strips
	LR	16:55:39	backing at loading dock
	FB	15:37:36	
inner_front	UD	16:27:48	rumble strips
	LR	16:30:02	rumble strips
	FB	15:42:19	
inner_back	UD	16:27:48	rumble strips
	LR	16:55:39	
	FB	15:42:19	
outer_front	UD	16:53:02	
	LR	15:42:10	
	FB	16:29:31	rumble strips
outer_back	UD	15:42:10	
	LR	15:42:10	
	FB	15:42:10	
floor	UD	15:42:10	
	LR	15:25:51	
	FB	15:25:51	

Table 1: Biggest shocks observed in each direction for each sensor

2.1 Box front

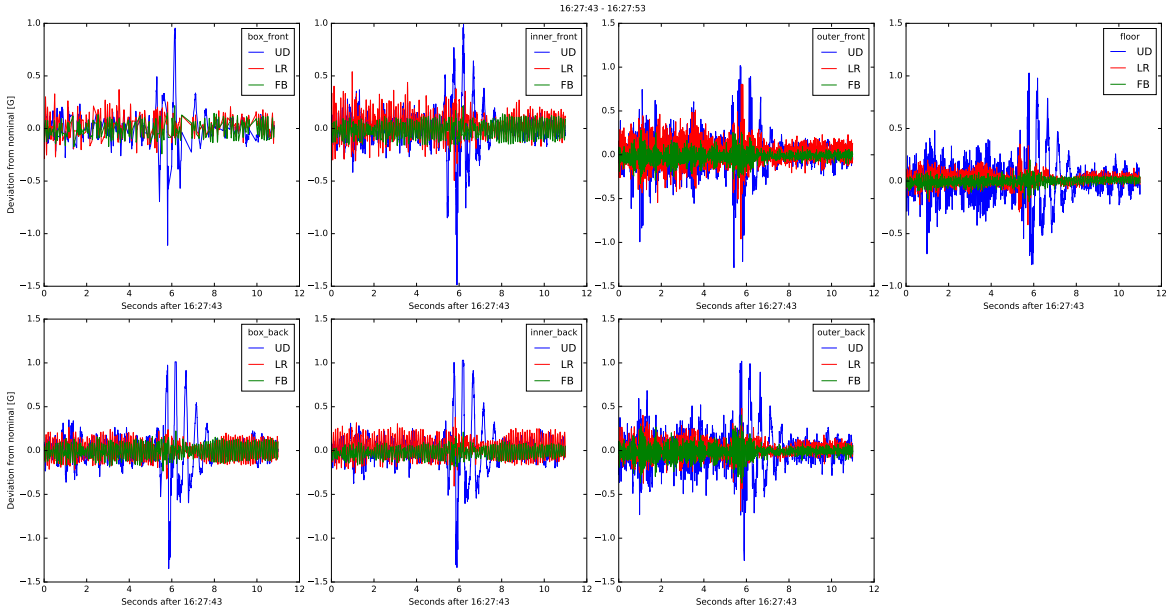

Figure 2: ±5s window of all accelerometers when the biggest shock was experienced by box front UD

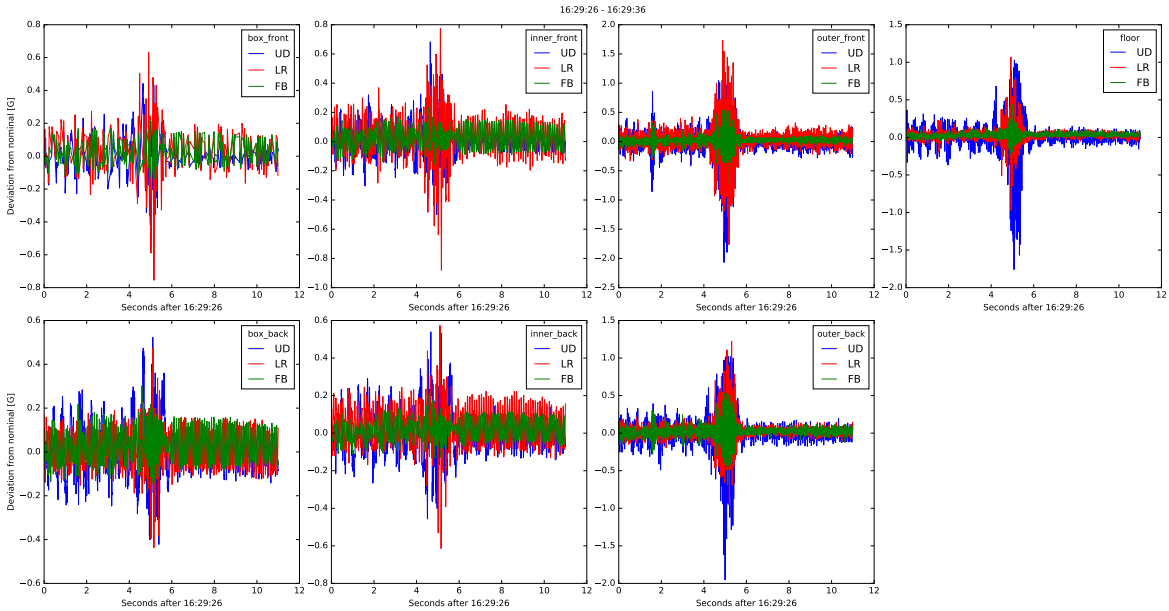

Figure 3: ±5s window of all accelerometers when the biggest shock was experienced by box front LR

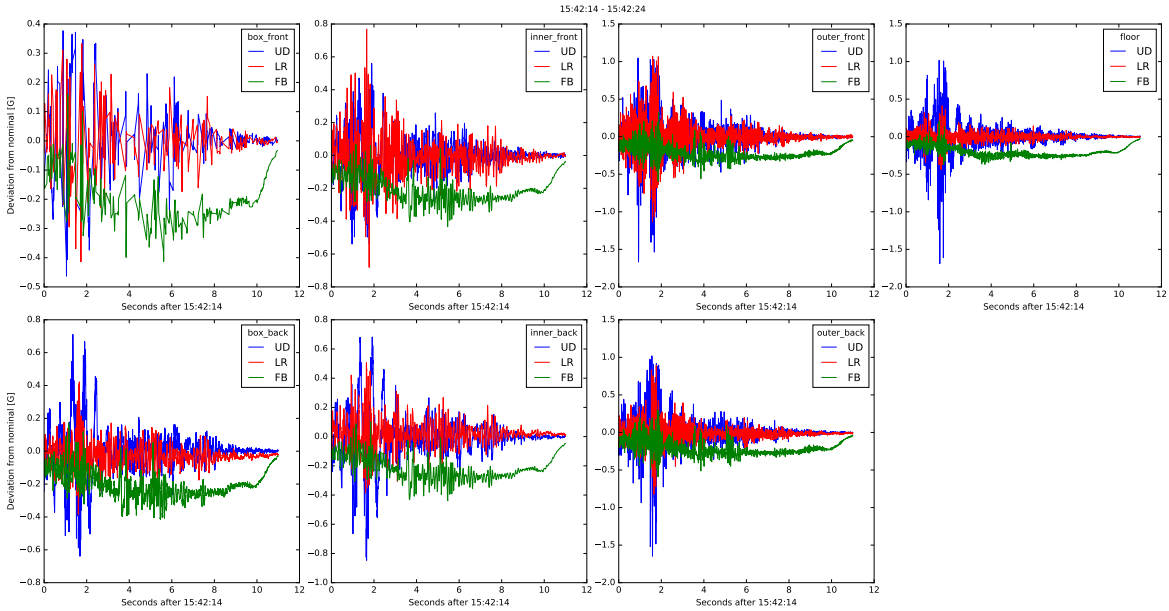

Figure 4: ±5s window of all accelerometers when the biggest shock was experienced by box front FB

2.2 Box back

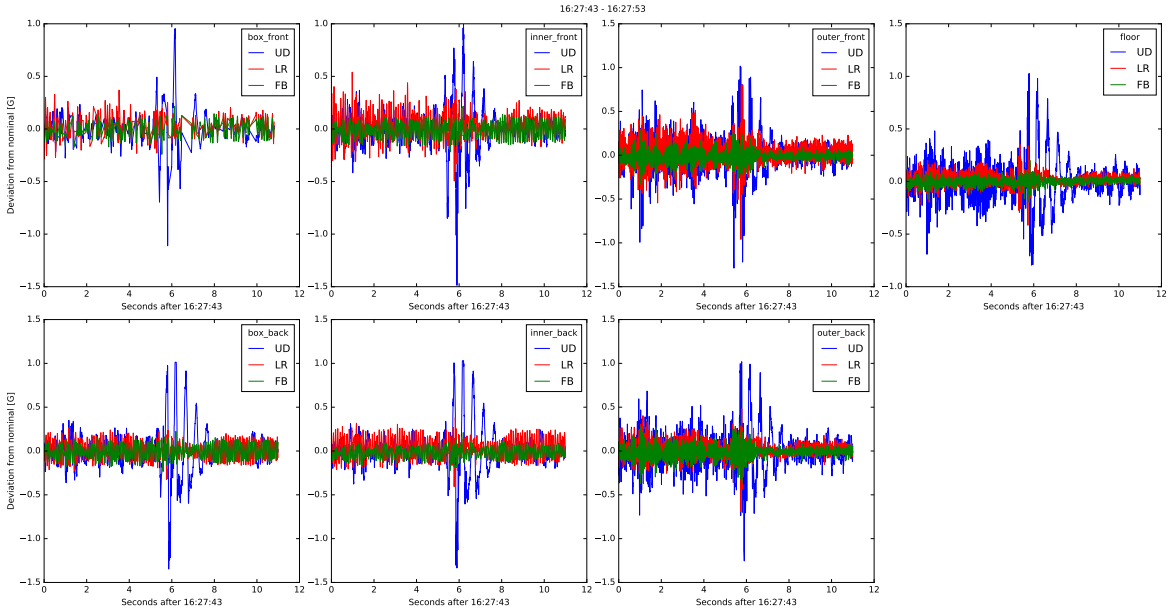

Figure 5: ±5s window of all accelerometers when the biggest shock was experienced by box back UD

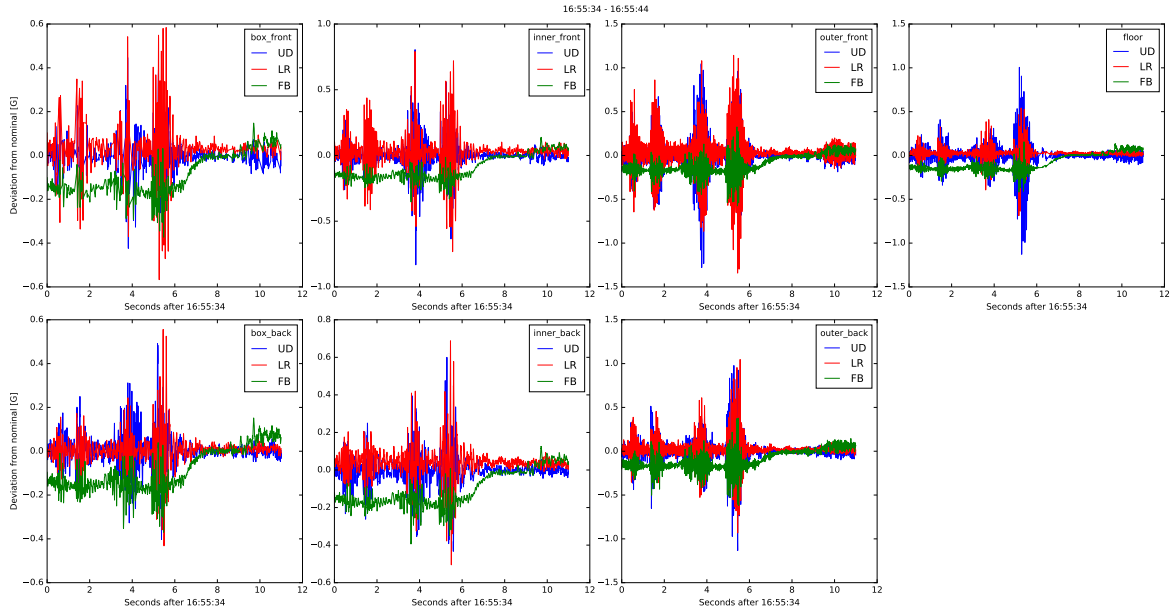

Figure 6: ±5s window of all accelerometers when the biggest shock was experienced by box back LR

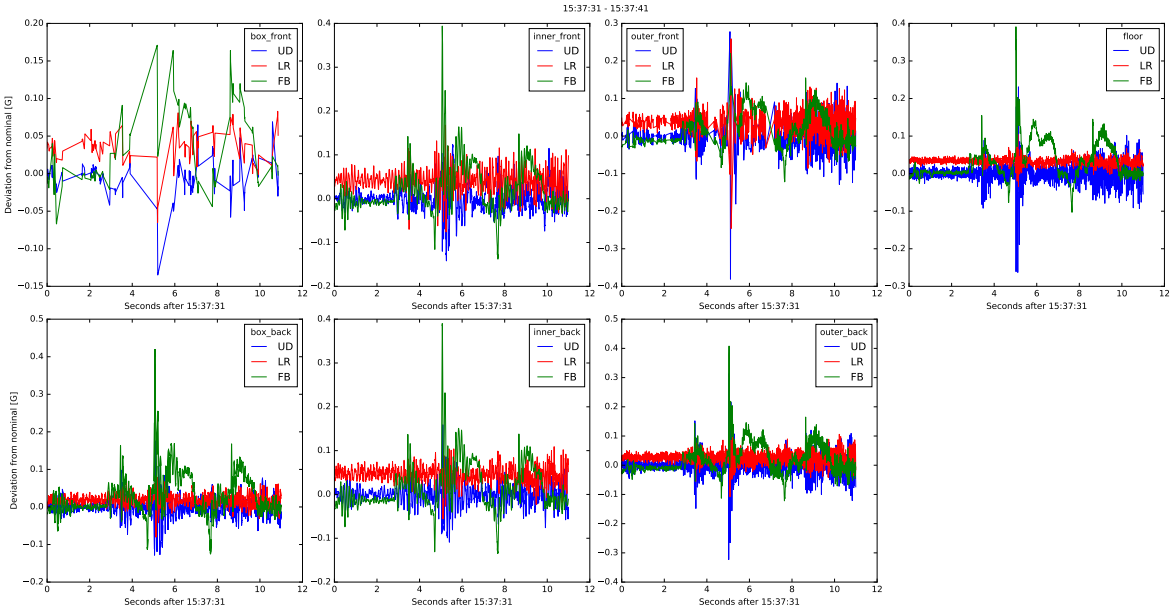

Figure 7: ±5s window of all accelerometers when the biggest shock was experienced by box back FB

2.3 Inner front

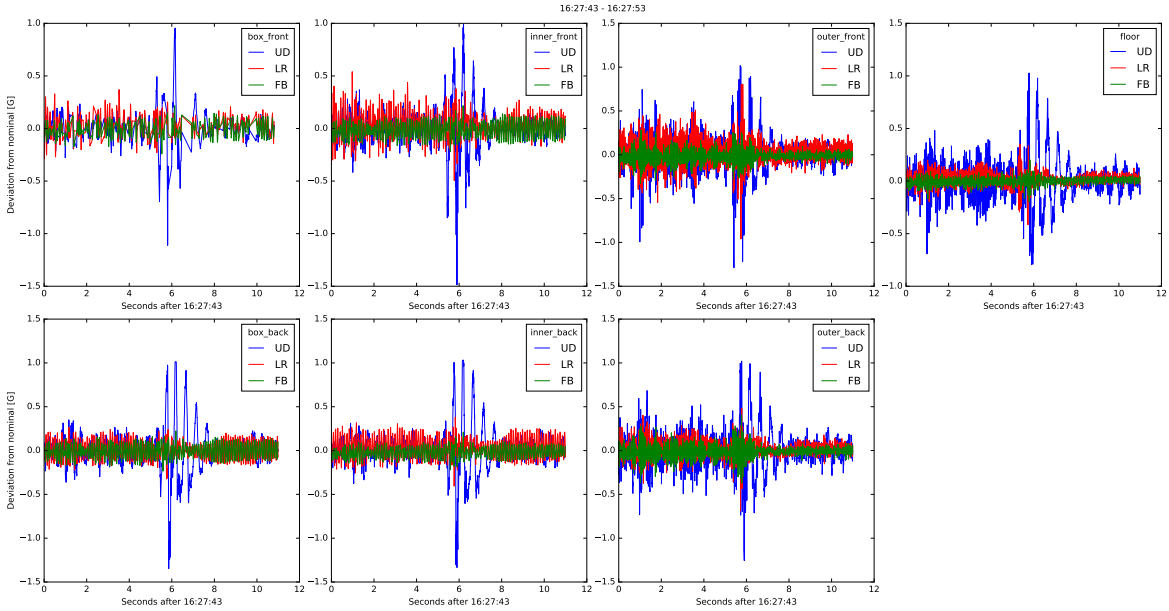

Figure 8: ±5s window of all accelerometers when the biggest shock was experienced by inner front UD

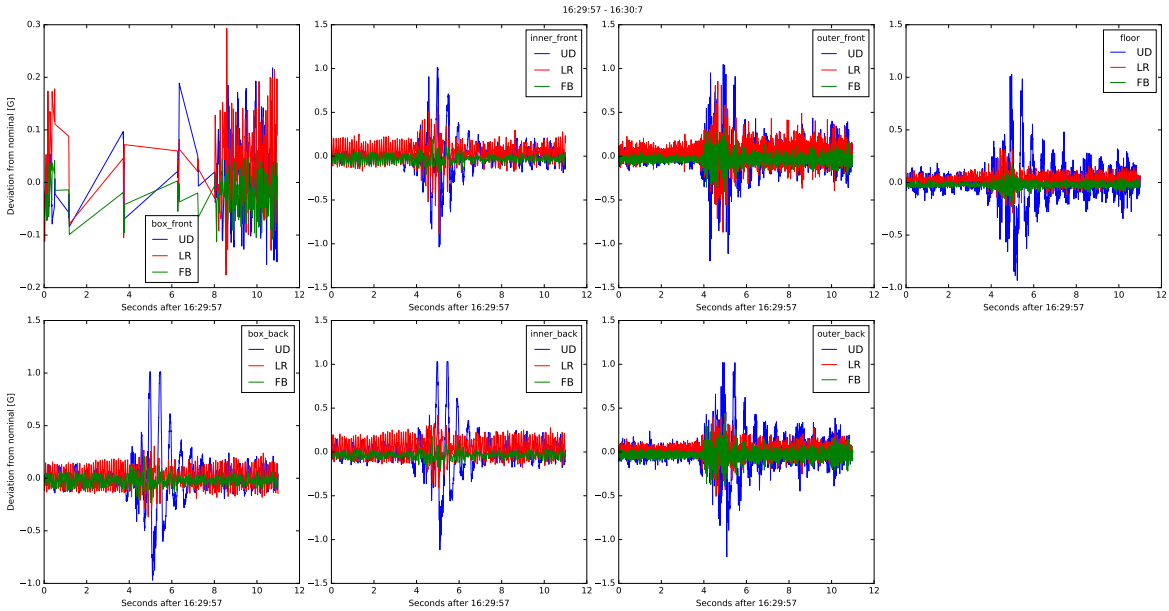

Figure 9: ±5s window of all accelerometers when the biggest shock was experienced by inner front LR

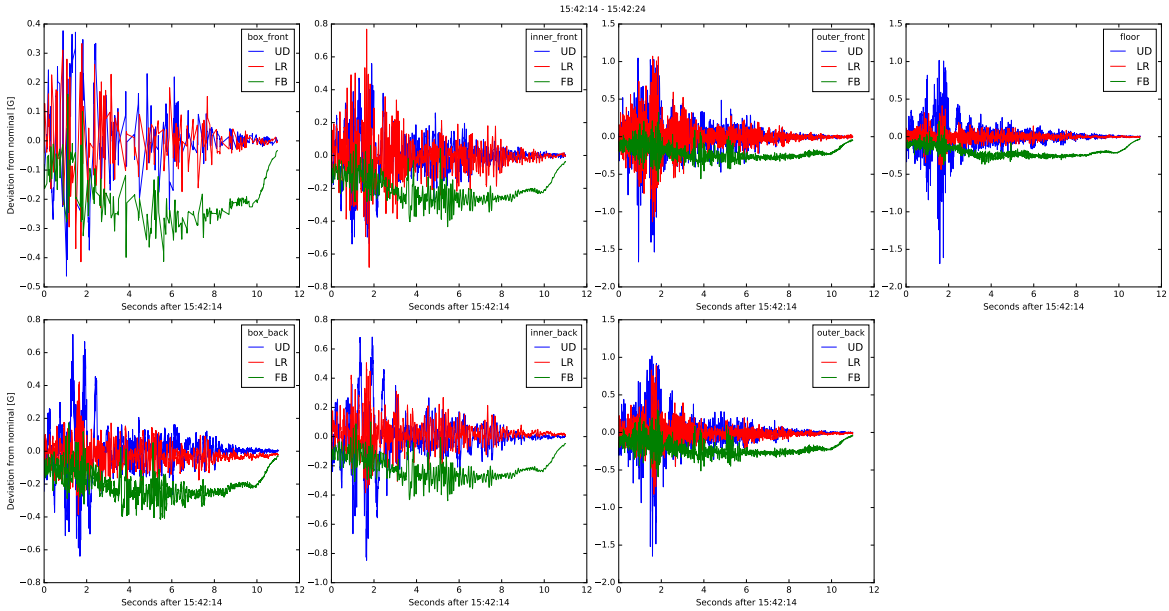

Figure 10: ±5s window of all accelerometers when the biggest shock was experienced by inner front FB

2.4 Inner back

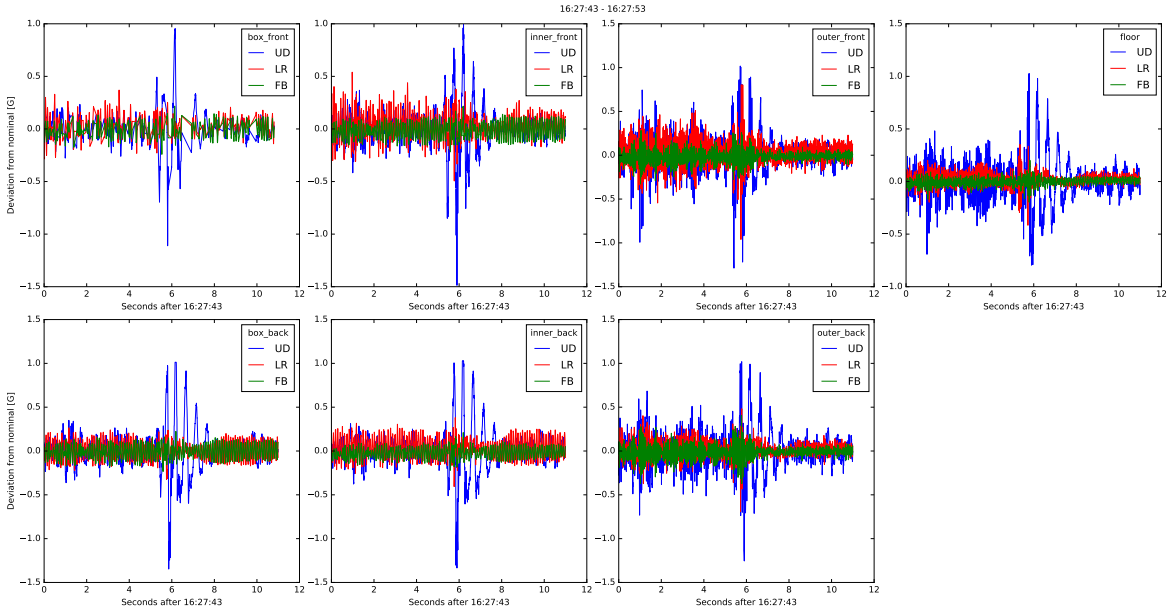

Figure 11: ±5s window of all accelerometers when the biggest shock was experienced by inner back UD

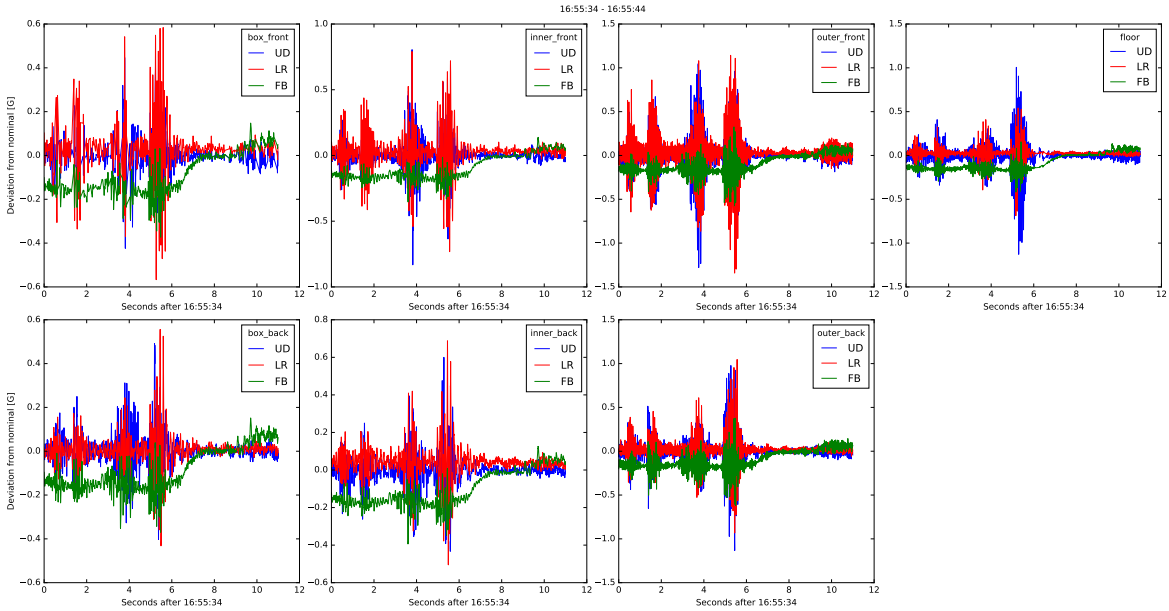

Figure 12: ±5s window of all accelerometers when the biggest shock was experienced by inner back LR

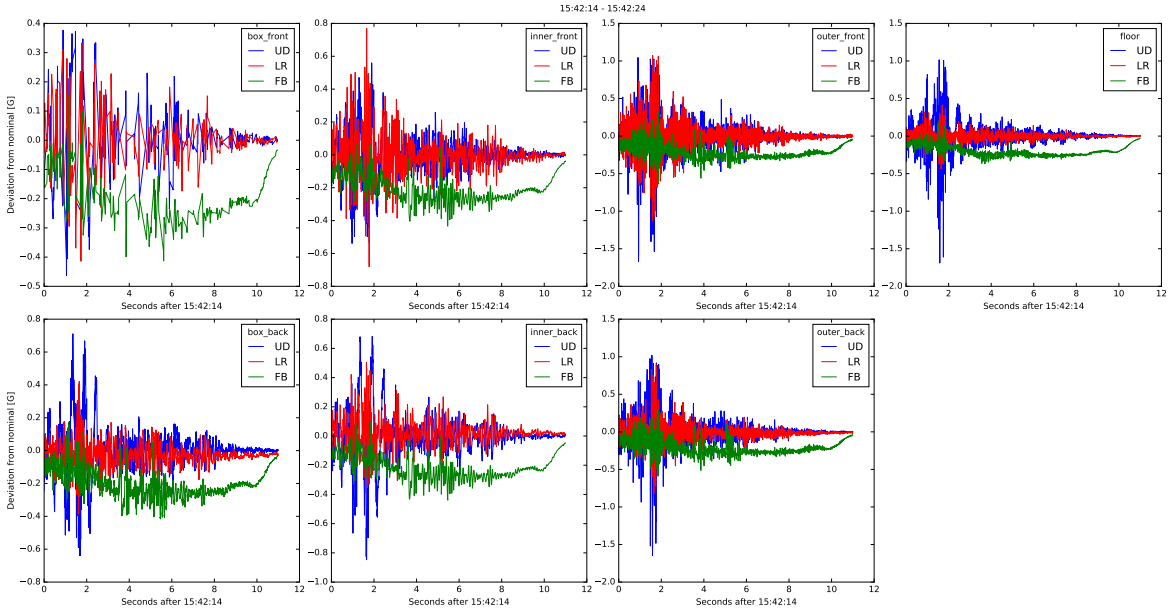

Figure 13: ±5s window of all accelerometers when the biggest shock was experienced by inner back FB

2.5 Outer front

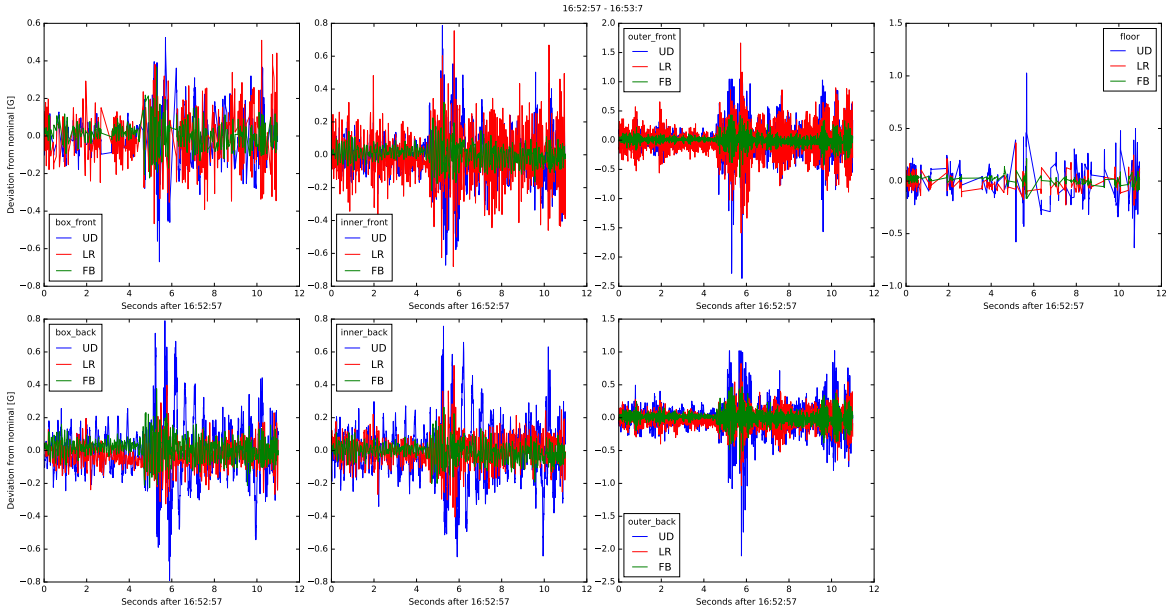

Figure 14: ±5s window of all accelerometers when the biggest shock was experienced by outer front UD

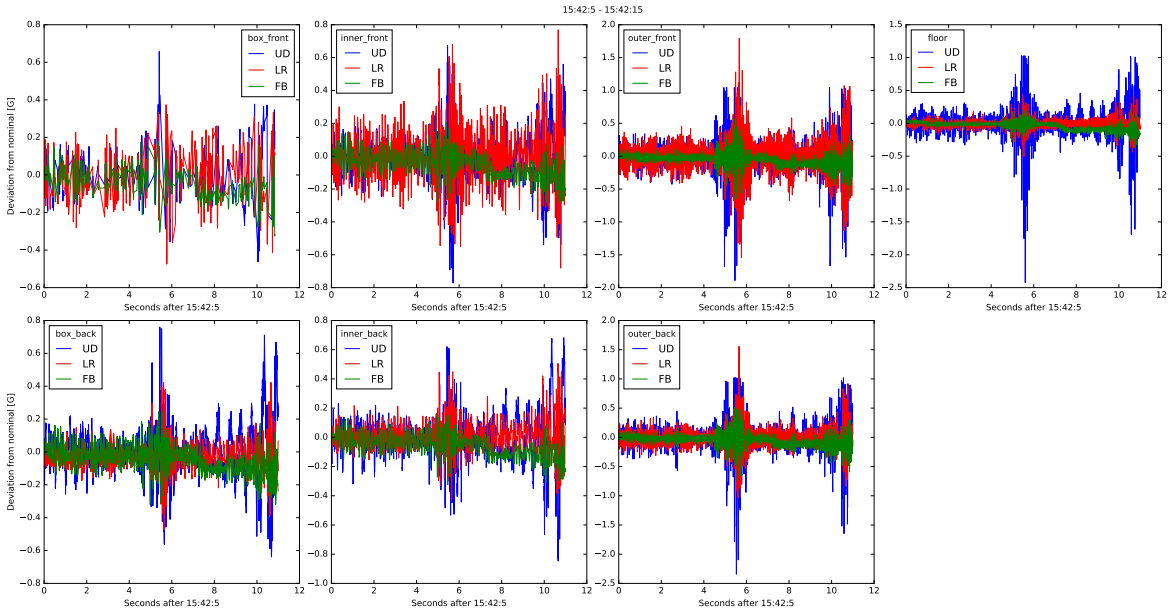

Figure 15: ±5s window of all accelerometers when the biggest shock was experienced by outer front LR

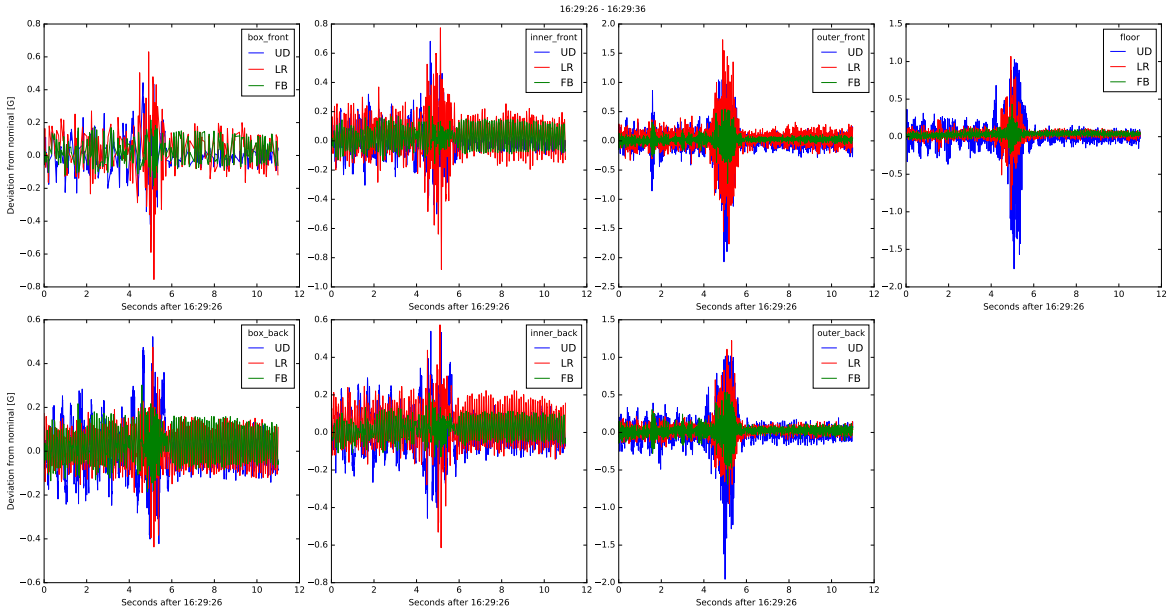

Figure 16: ±5s window of all accelerometers when the biggest shock was experienced by outer front FB

2.6 Outer back

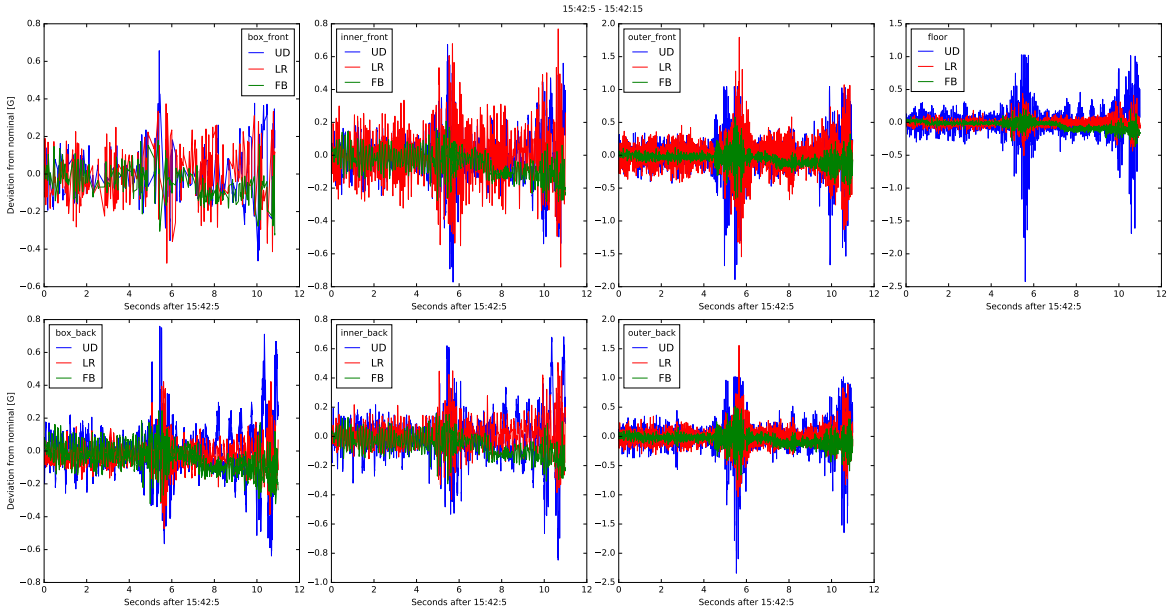

Figure 17: ±5s window of all accelerometers when the biggest shock was experienced by outer back UD

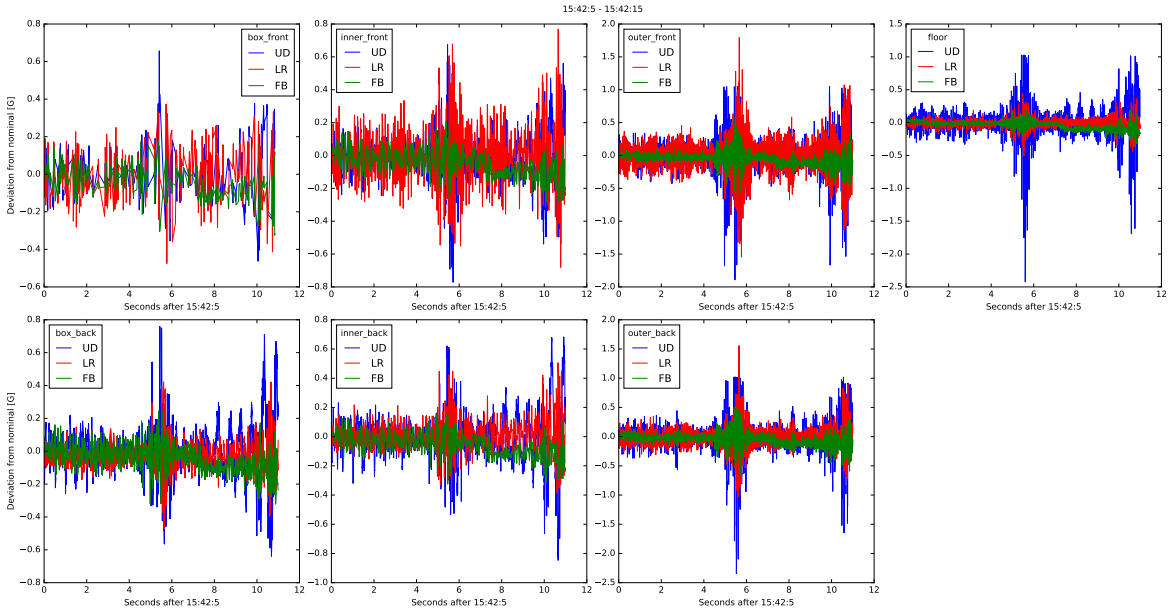

Figure 18: ±5s window of all accelerometers when the biggest shock was experienced by outer back LR

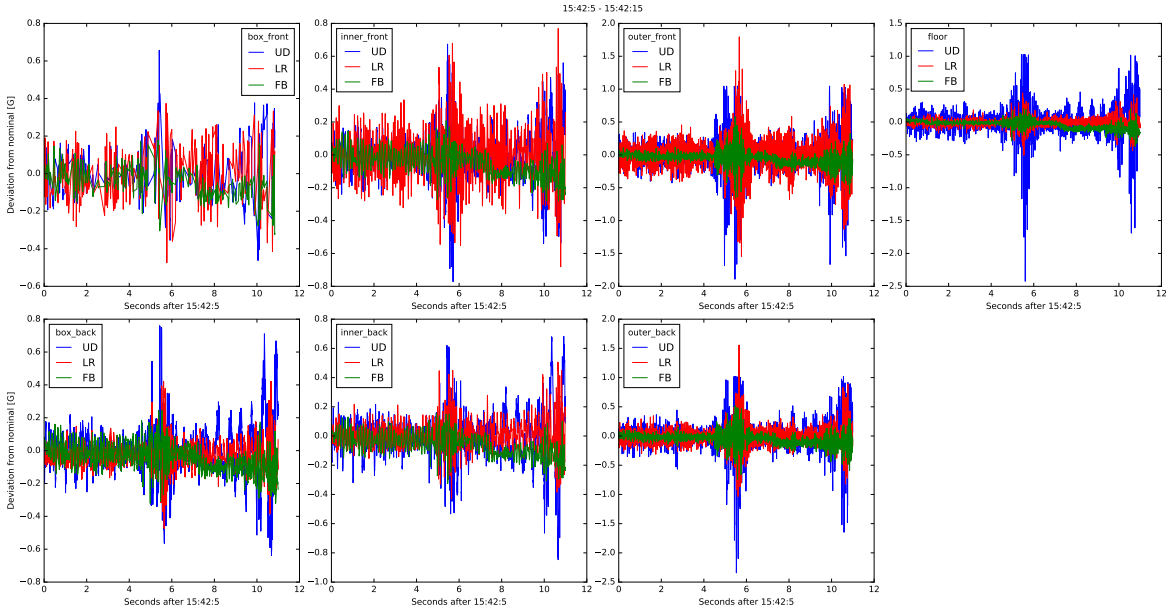

Figure 19: ±5s window of all accelerometers when the biggest shock was experienced by outer back FB

2.7 Floor

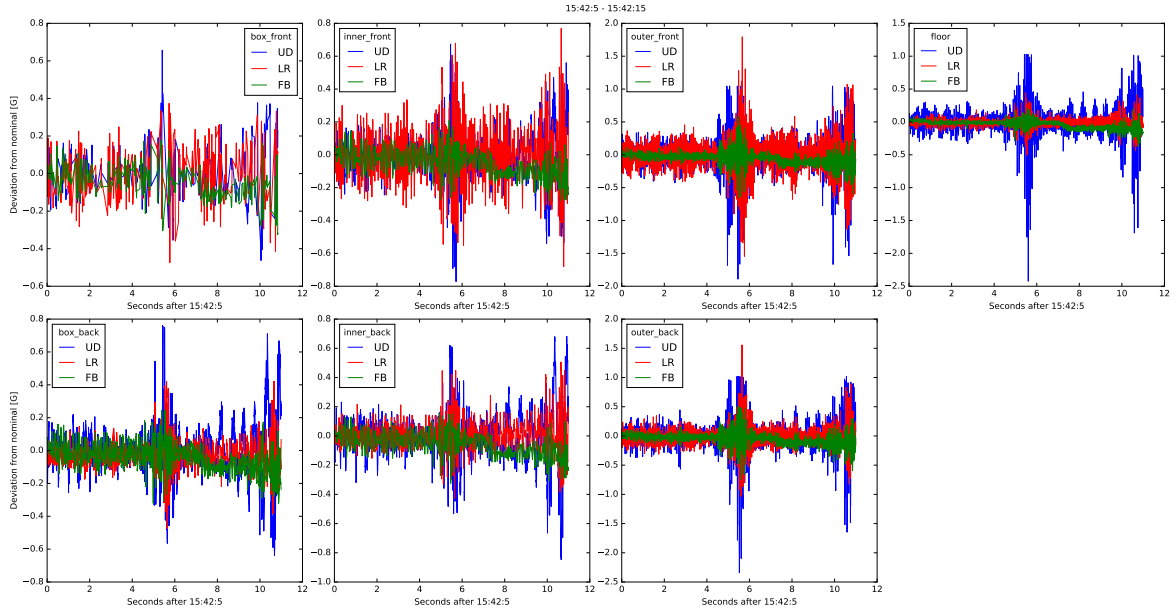

Figure 20: ±5s window of all accelerometers when the biggest shock was experienced by floor UD

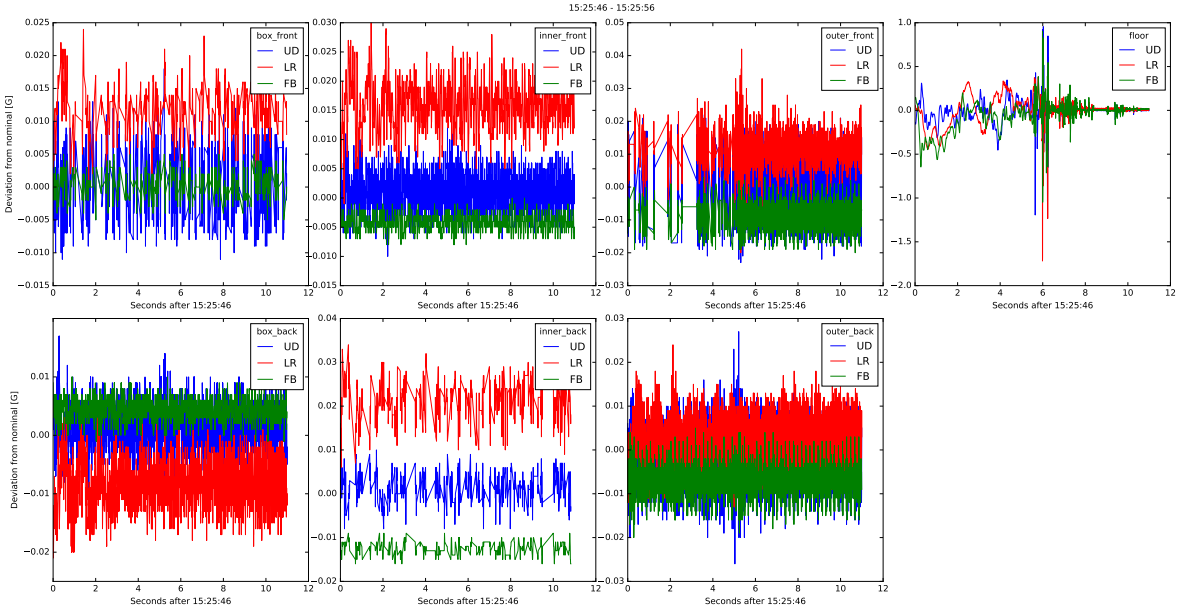

Figure 21: ±5s window of all accelerometers when the biggest shock was experienced by floor LR

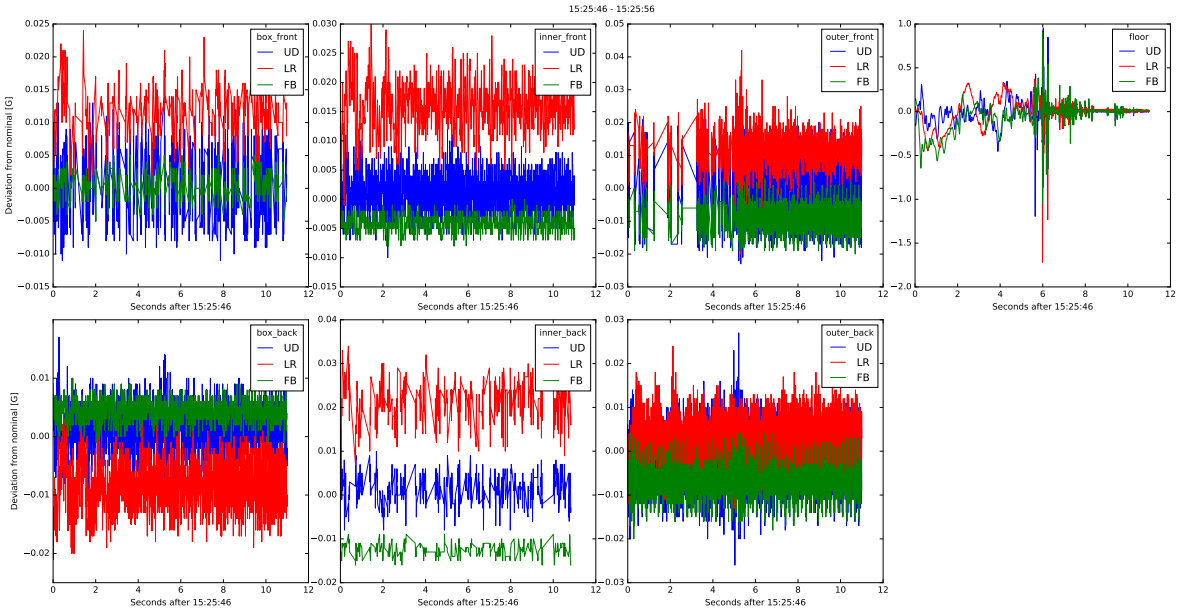

Figure 22: ±5s window of all accelerometers when the biggest shock was experienced by floor FB