



Kinematics Report

Simulation Author: Robert Horvath

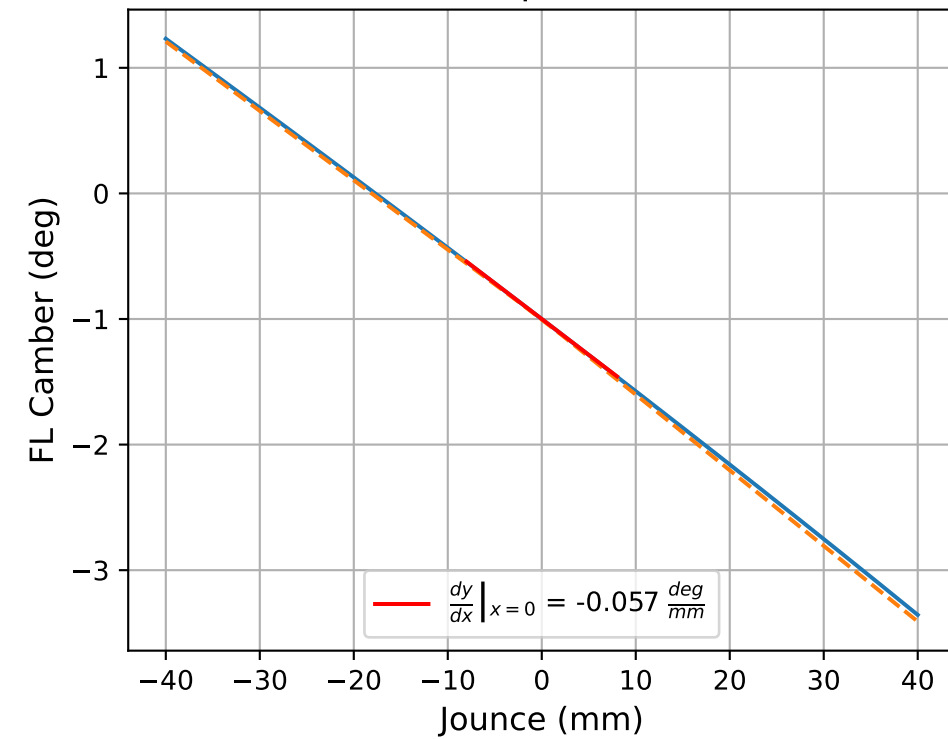
Generated By: Robert (roberthorvath5@gmail.com)

Date: 2025-06-16, 10:47 PM PDT

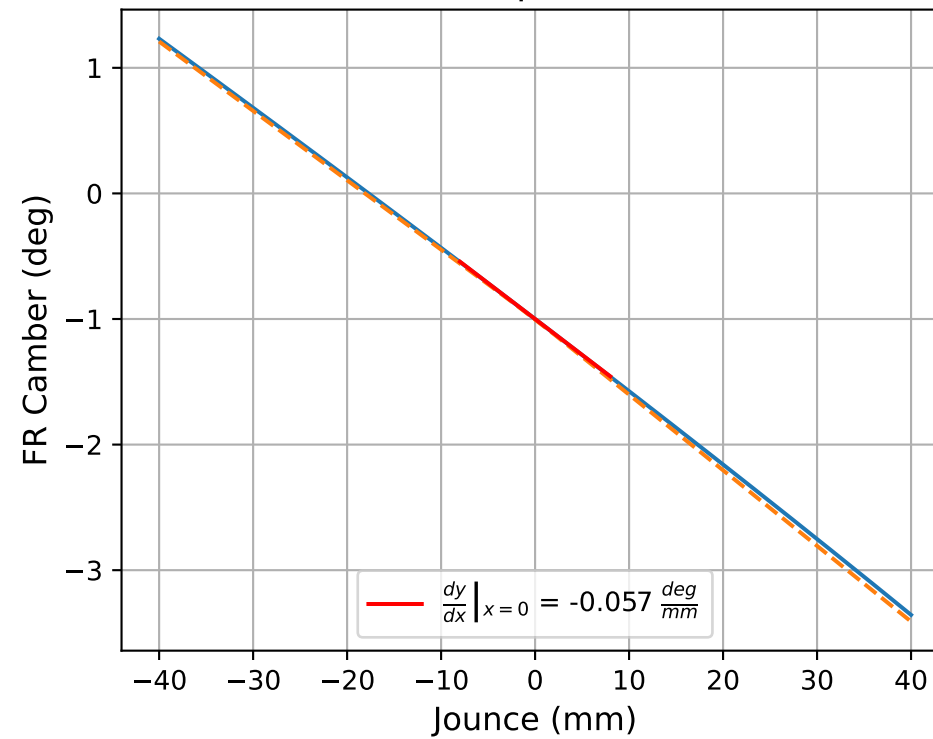
Note 1: Linear fits are tangent lines about $x = 0$ (NOT fits over the entire range)

Note 2: Cubic fits are performed over the entire visible domain (fits over the entire range)

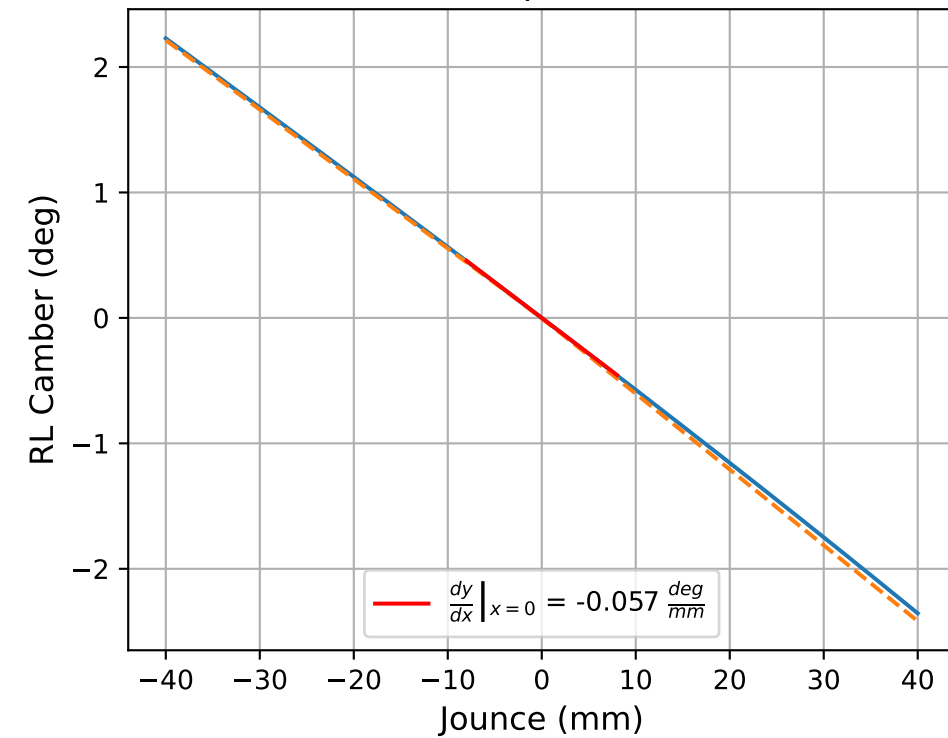
FL Bump Camber



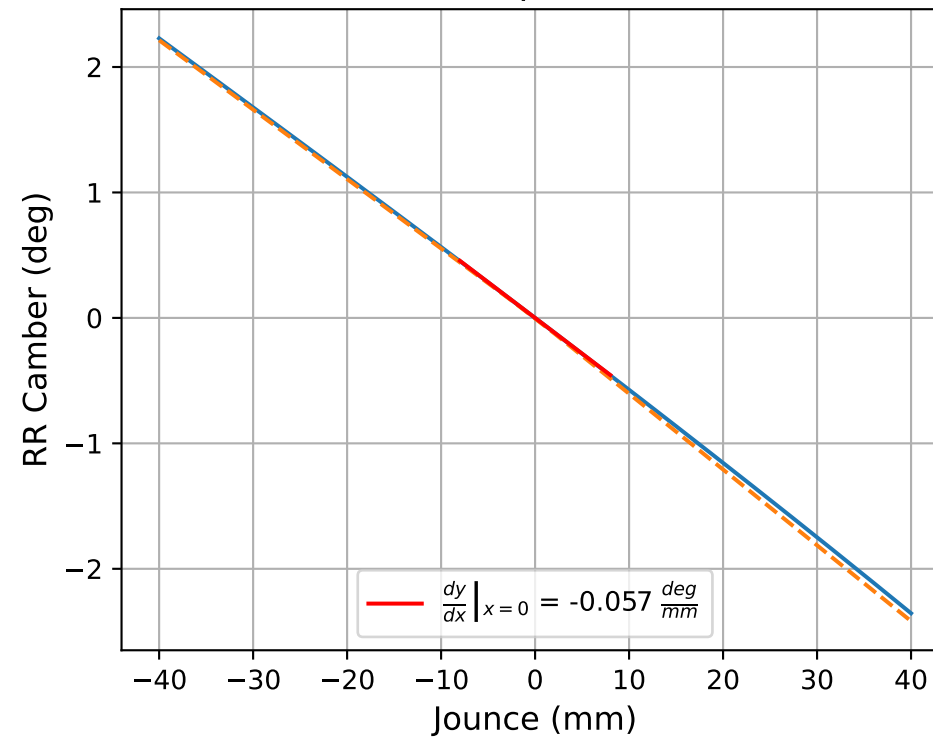
FR Bump Camber



RL Bump Camber



RR Bump Camber



— Full Model
- - - FMU

Linear Fit

$$f(x) = a_1x + a_0$$

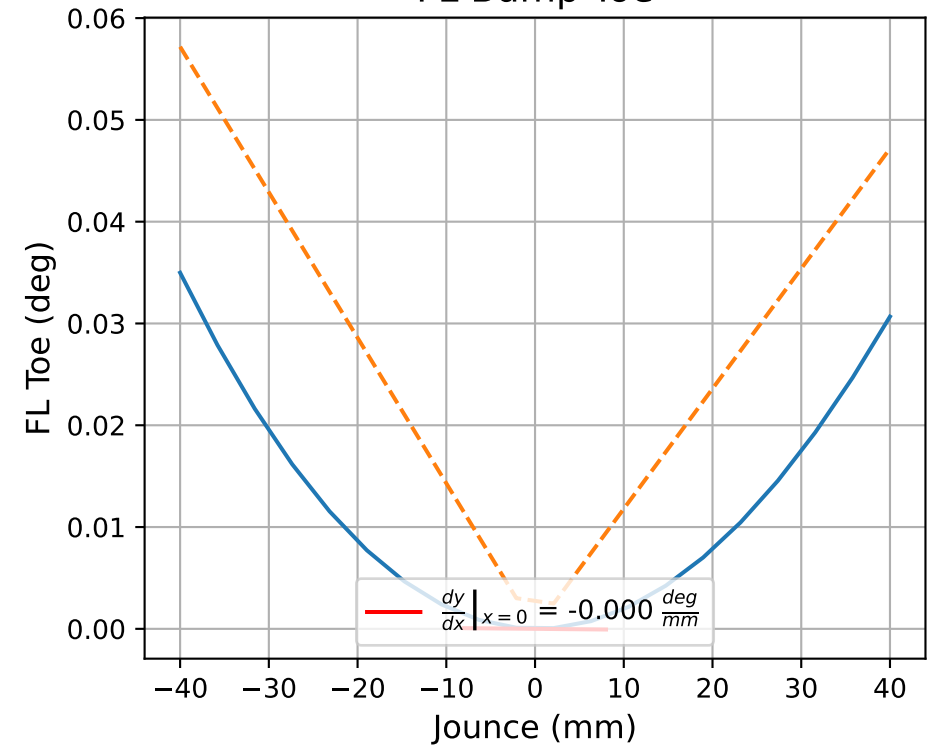
FL	$f(x) = -0.057x + -1.0$
FR	$f(x) = -0.057x + -1.0$
RL	$f(x) = -0.057x + 0.0$
RR	$f(x) = -0.057x + 0.0$

Cubic Fit

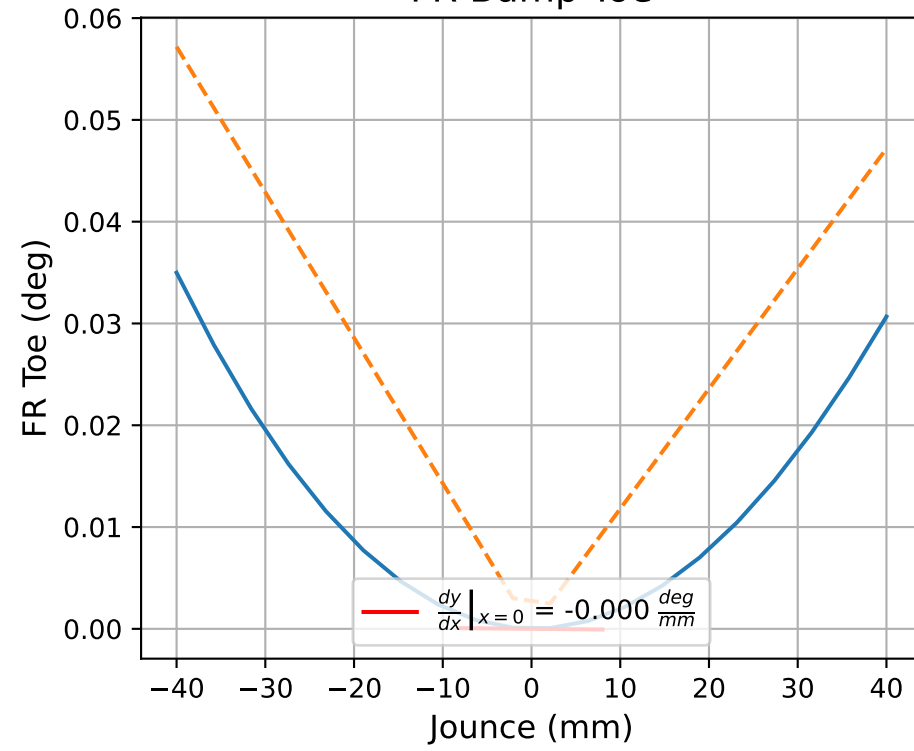
$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = -0.0x^3 + -0.0x^2 + -0.057x + -1.0$
FR	$f(x) = -0.0x^3 + -0.0x^2 + -0.057x + -1.0$
RL	$f(x) = -0.0x^3 + -0.0x^2 + -0.057x + 0.0$
RR	$f(x) = -0.0x^3 + -0.0x^2 + -0.057x + 0.0$

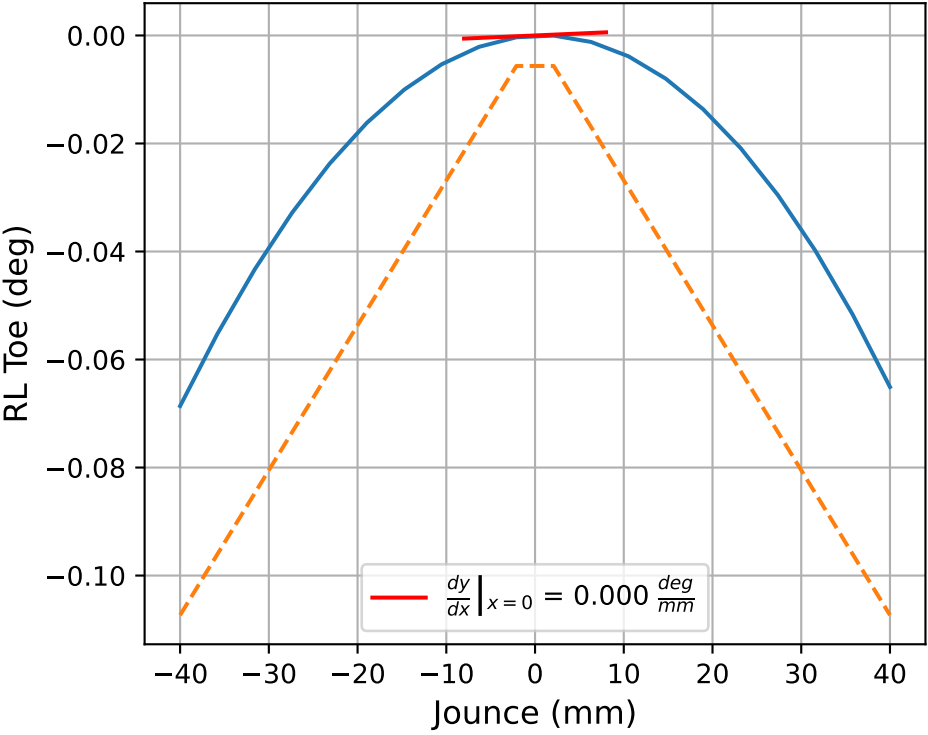
FL Bump Toe



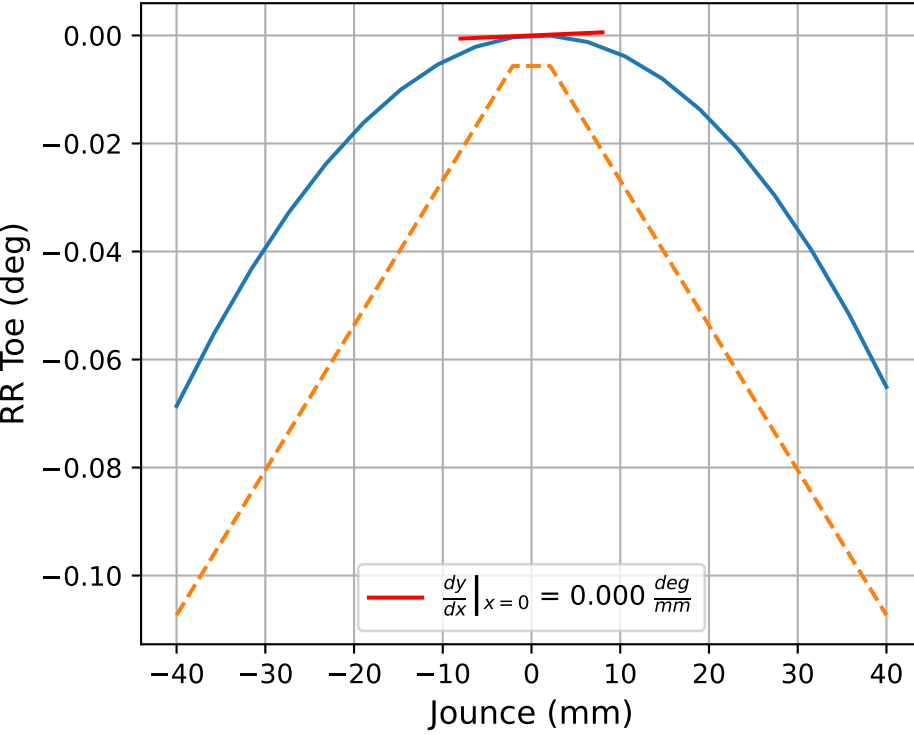
FR Bump Toe



RL Bump Toe



RR Bump Toe



Linear Fit

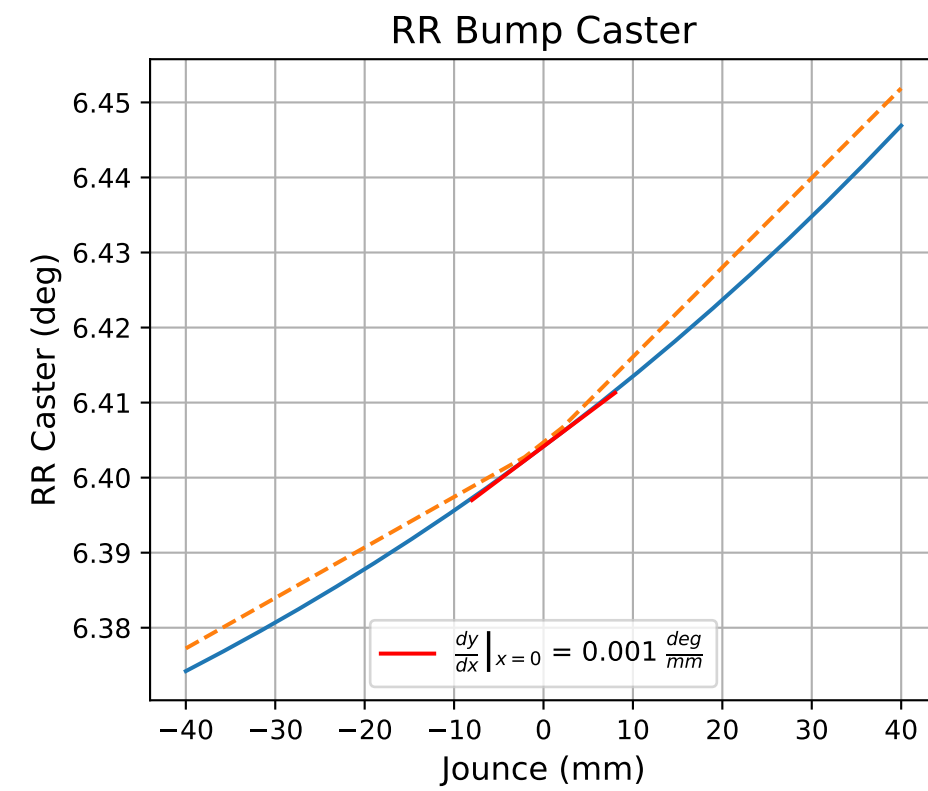
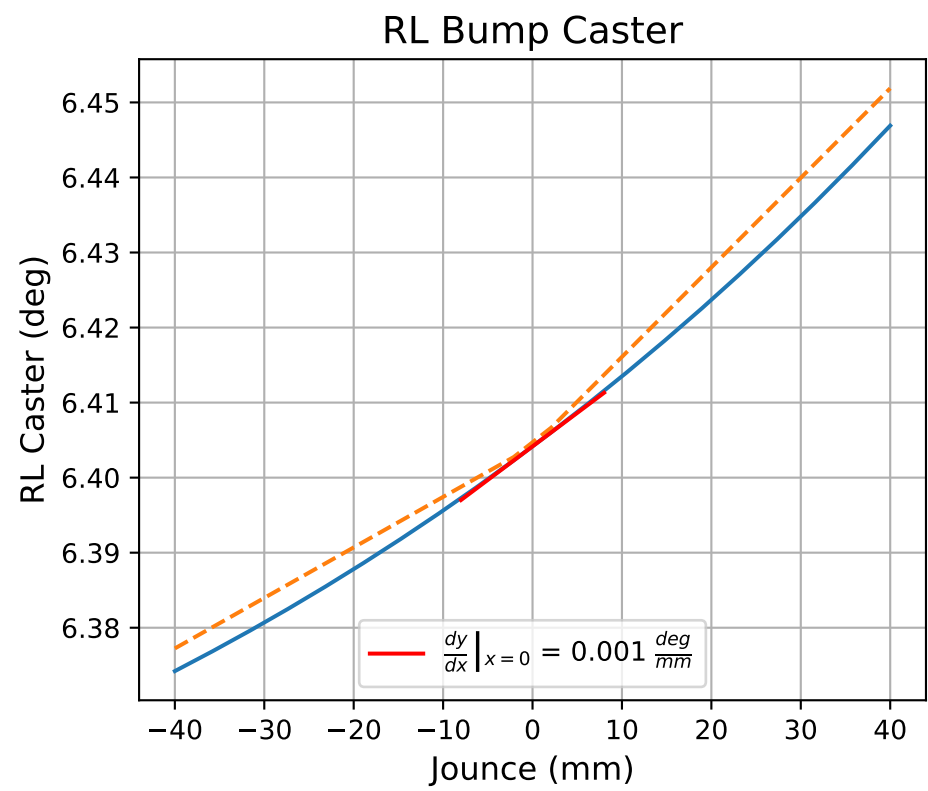
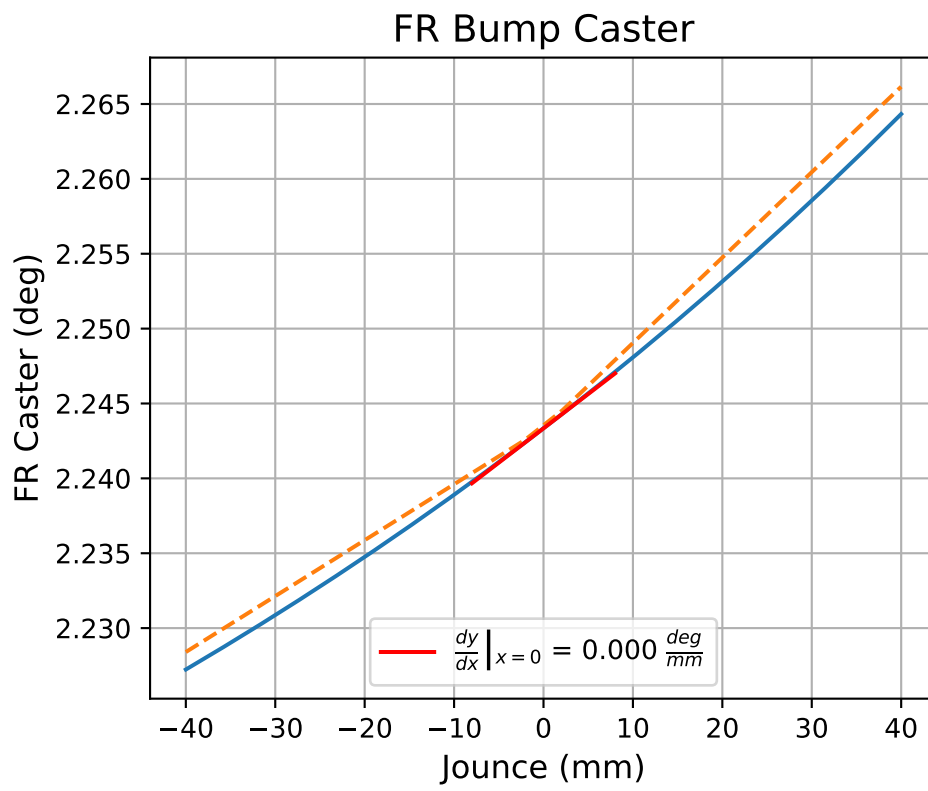
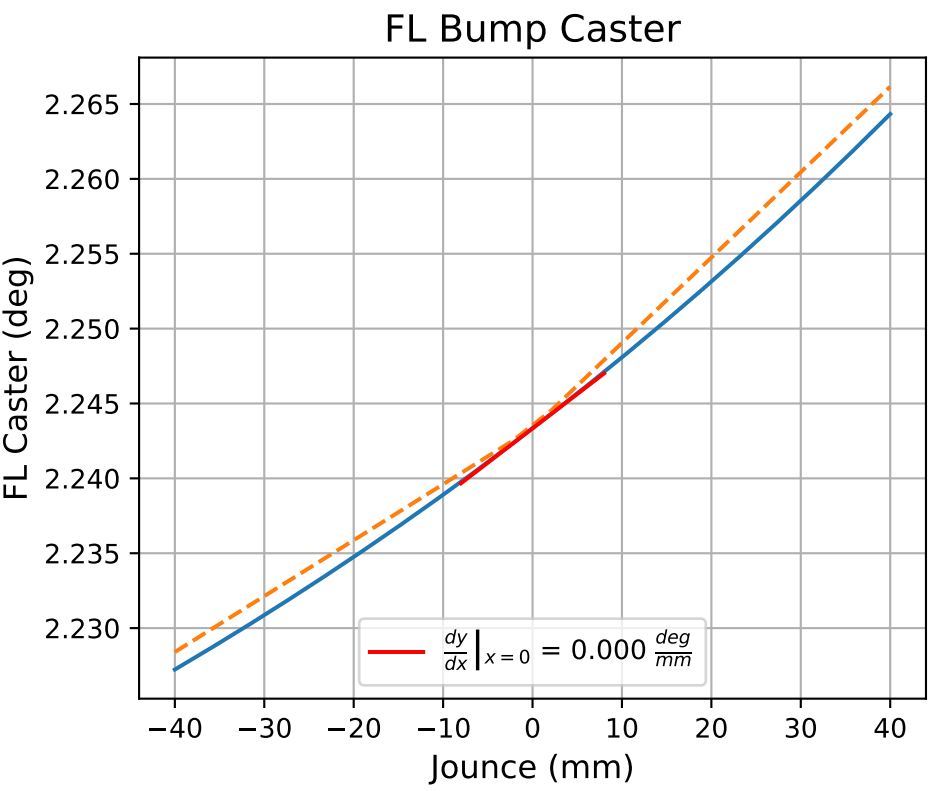
$f(x) = a_1x + a_0$

FL	$f(x) = -0.0x + -0.0$
FR	$f(x) = -0.0x + -0.0$
RL	$f(x) = 0.0x + 0.0$
RR	$f(x) = 0.0x + 0.0$

Cubic Fit

$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$

FL	$f(x) = -0.0x^3 + 0.0x^2 + -0.0x + -0.0$
FR	$f(x) = -0.0x^3 + 0.0x^2 + -0.0x + -0.0$
RL	$f(x) = -0.0x^3 + -0.0x^2 + 0.0x + 0.0$
RR	$f(x) = -0.0x^3 + -0.0x^2 + 0.0x + 0.0$



Full Model

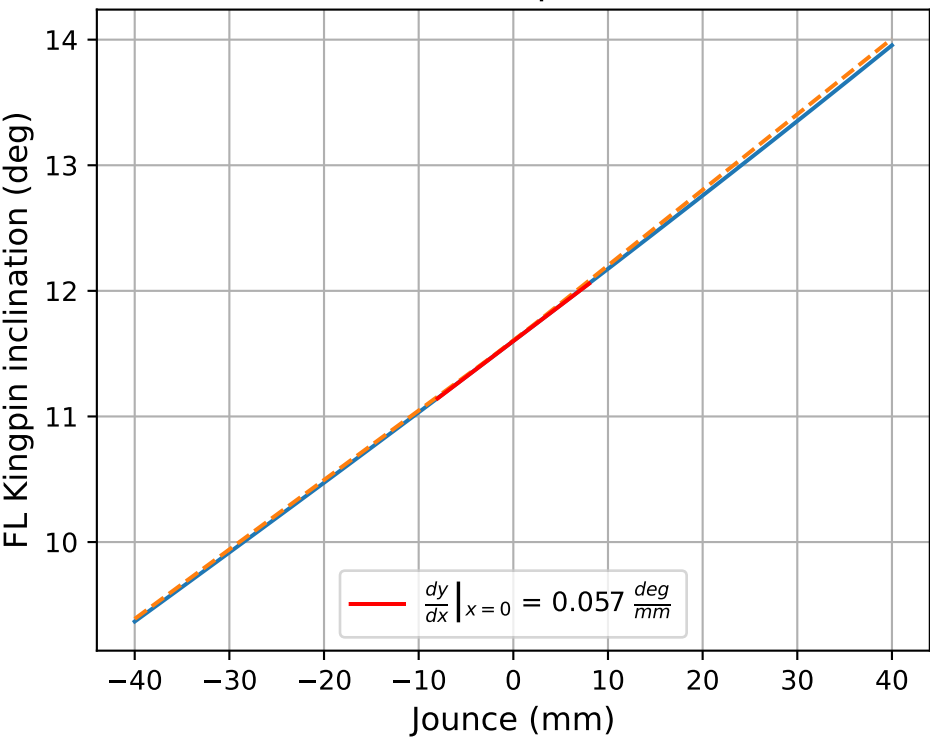
FMU

Linear Fit		$f(x) = a_1x + a_0$
FL	$f(x) = 0.0x + 2.243$	
FR	$f(x) = 0.0x + 2.243$	
RL	$f(x) = 0.001x + 6.404$	
RR	$f(x) = 0.001x + 6.404$	

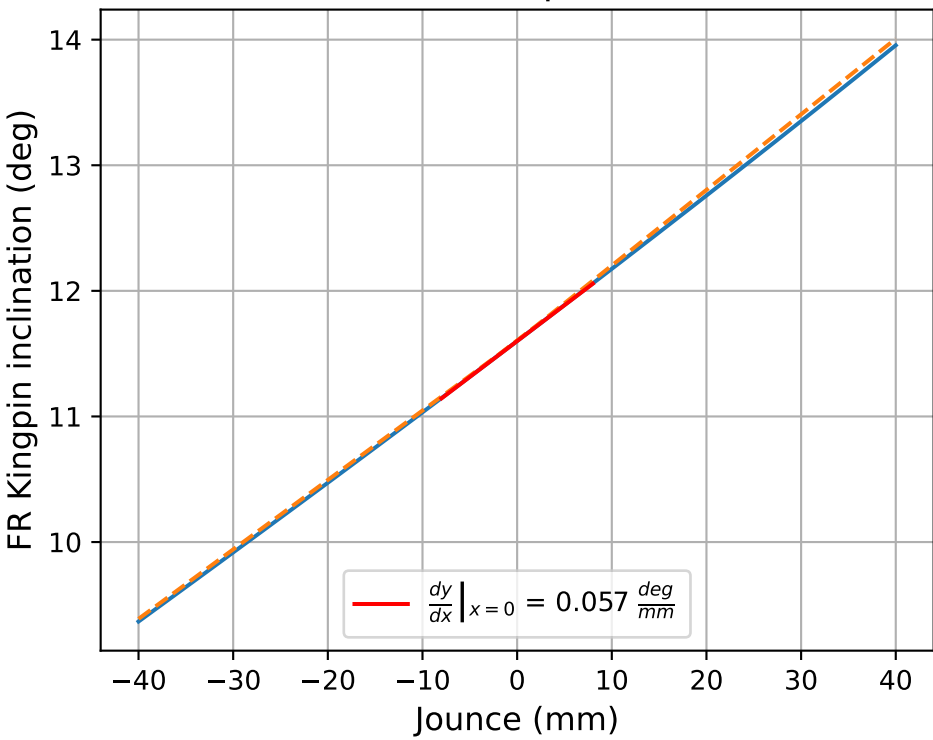
Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL	$f(x) = 0.0x^3 + 0.0x^2 + 0.0x + 2.243$	
FR	$f(x) = 0.0x^3 + 0.0x^2 + 0.0x + 2.243$	
RL	$f(x) = 0.0x^3 + 0.0x^2 + 0.001x + 6.404$	
RR	$f(x) = 0.0x^3 + 0.0x^2 + 0.001x + 6.404$	



FL Bump KPI



FR Bump KPI

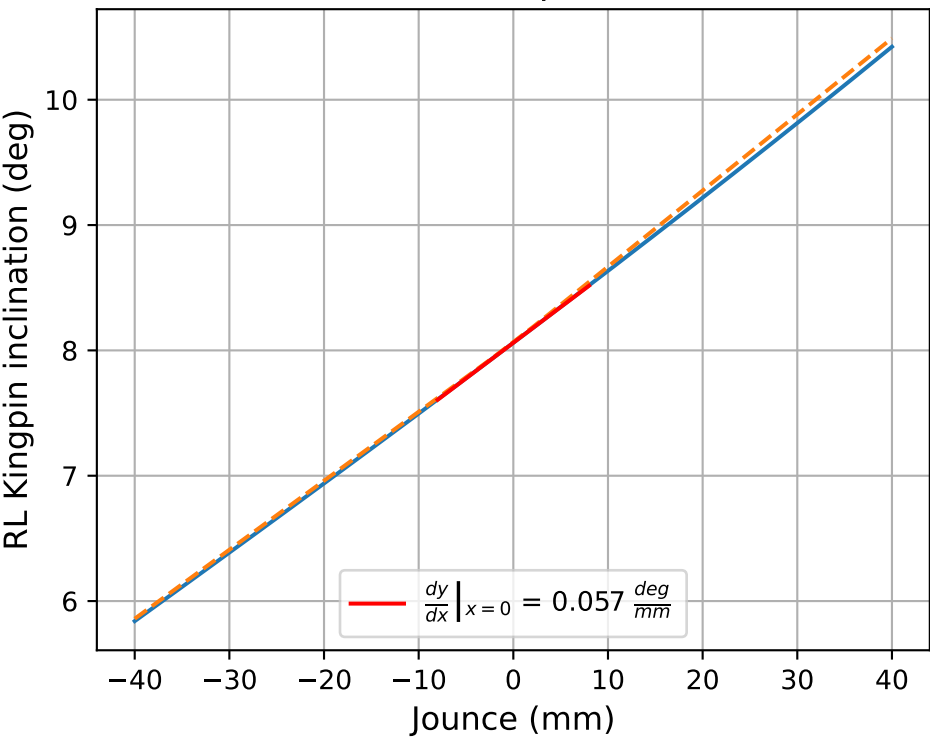


Linear Fit

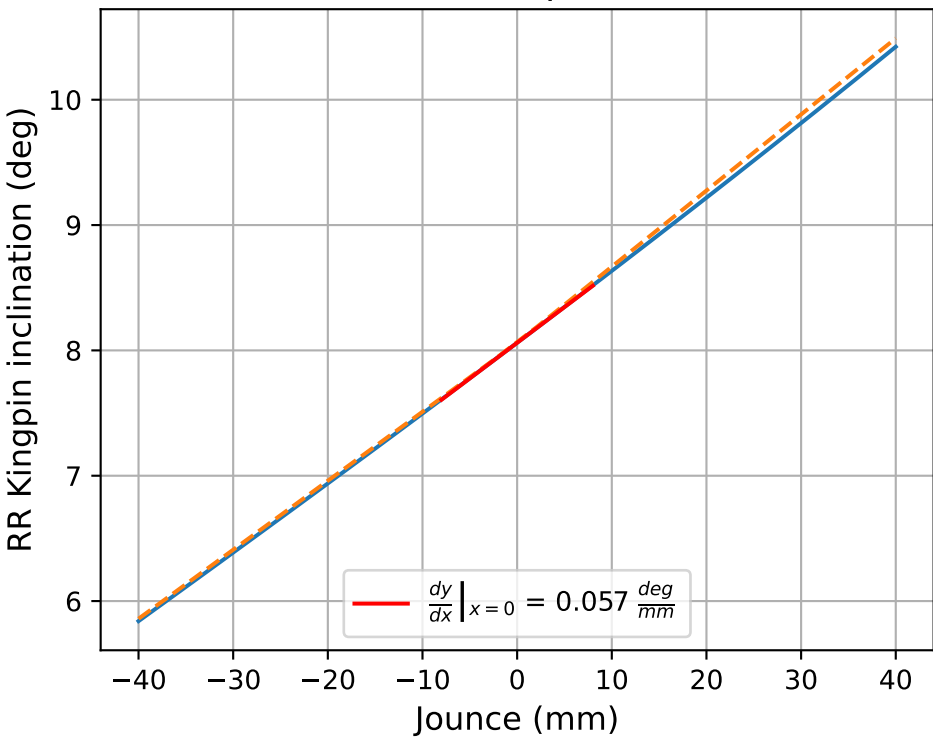
$$f(x) = a_1x + a_0$$

FL	$f(x) = 0.057x + 11.6$
FR	$f(x) = 0.057x + 11.6$
RL	$f(x) = 0.057x + 8.061$
RR	$f(x) = 0.057x + 8.061$

RL Bump KPI



RR Bump KPI

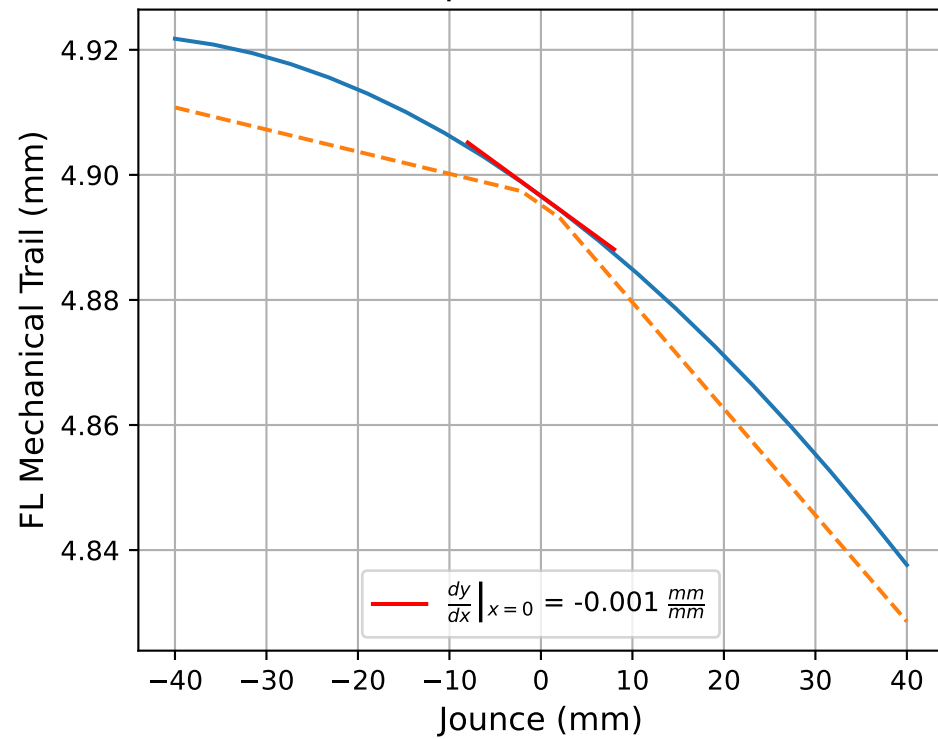


Cubic Fit

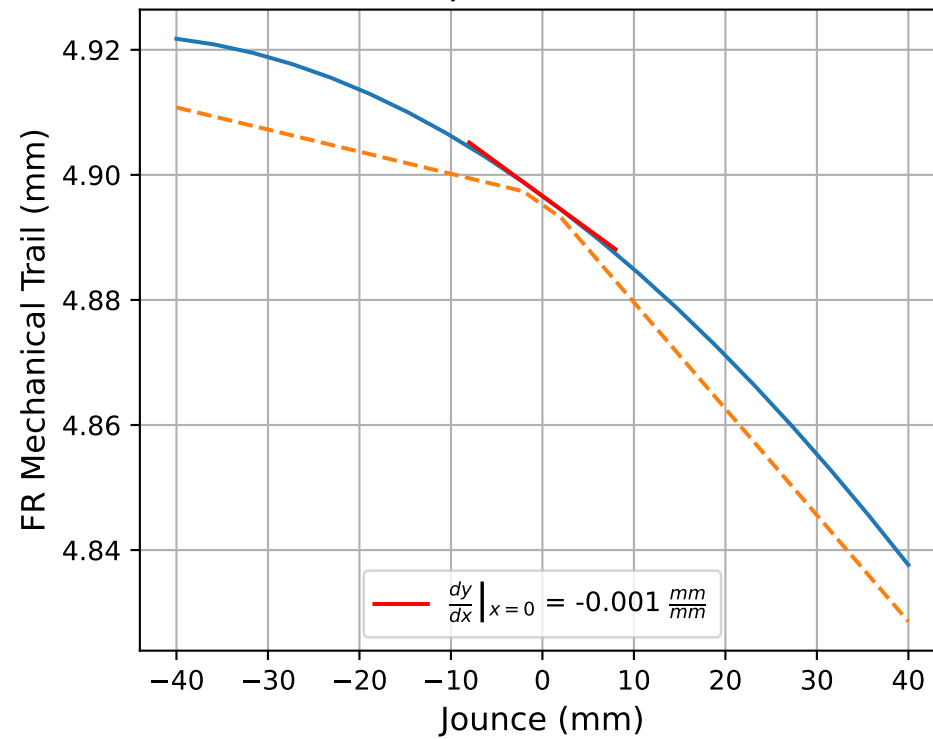
$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = 0.0x^3 + 0.0x^2 + 0.057x + 11.6$
FR	$f(x) = 0.0x^3 + 0.0x^2 + 0.057x + 11.6$
RL	$f(x) = 0.0x^3 + 0.0x^2 + 0.057x + 8.061$
RR	$f(x) = 0.0x^3 + 0.0x^2 + 0.057x + 8.061$

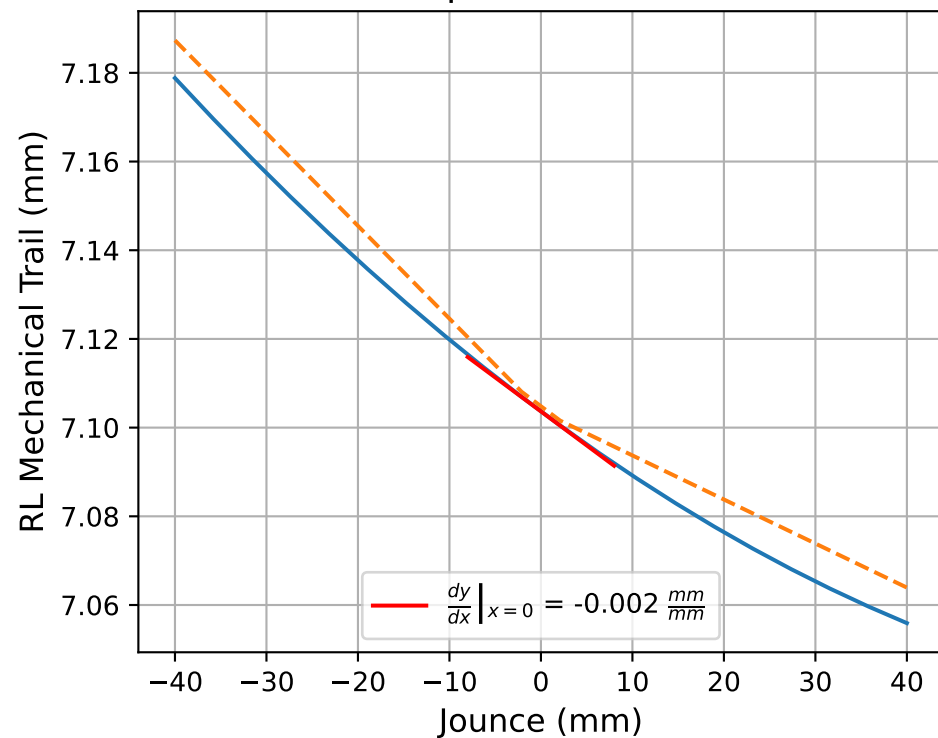
FL Bump Mechanical Trail



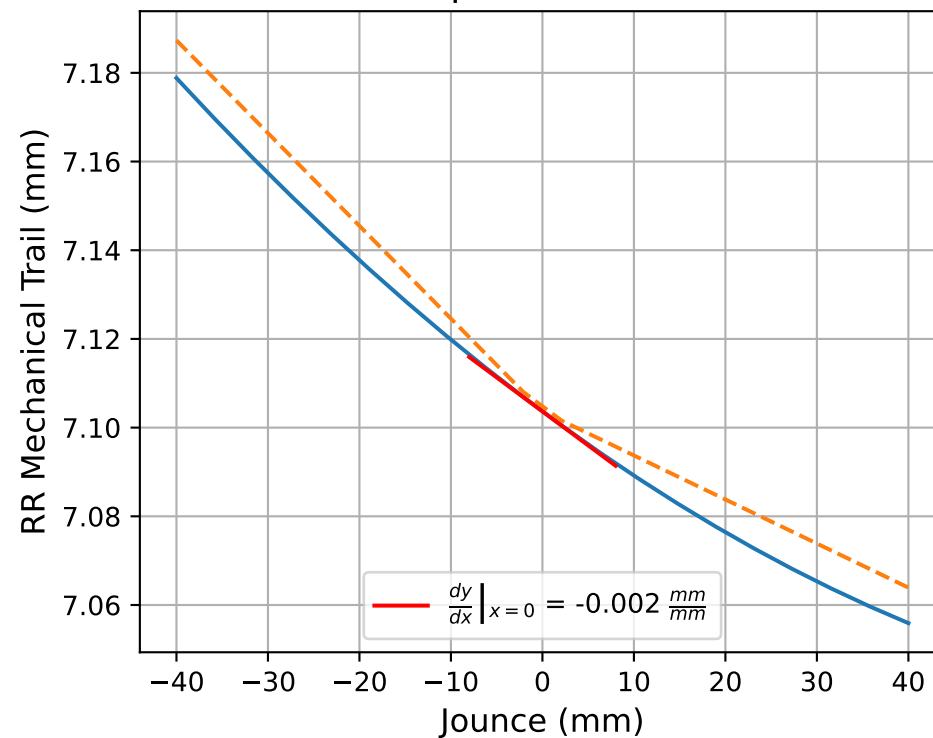
FR Bump Mechanical Trail



RL Bump Mechanical Trail



RR Bump Mechanical Trail



— Full Model
- - - FMU

Linear Fit

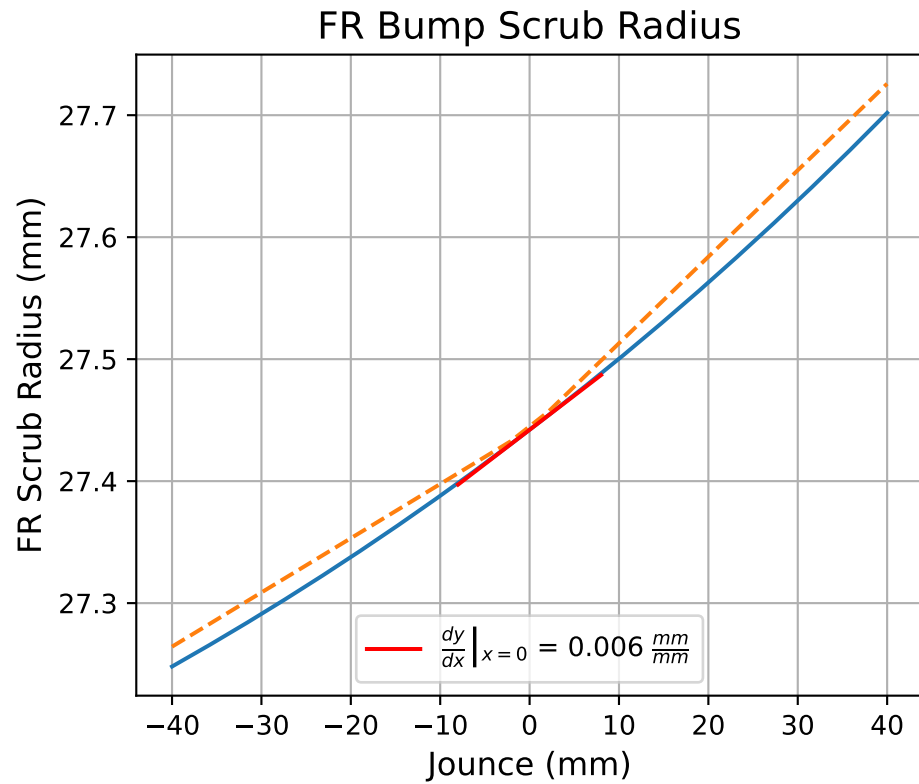
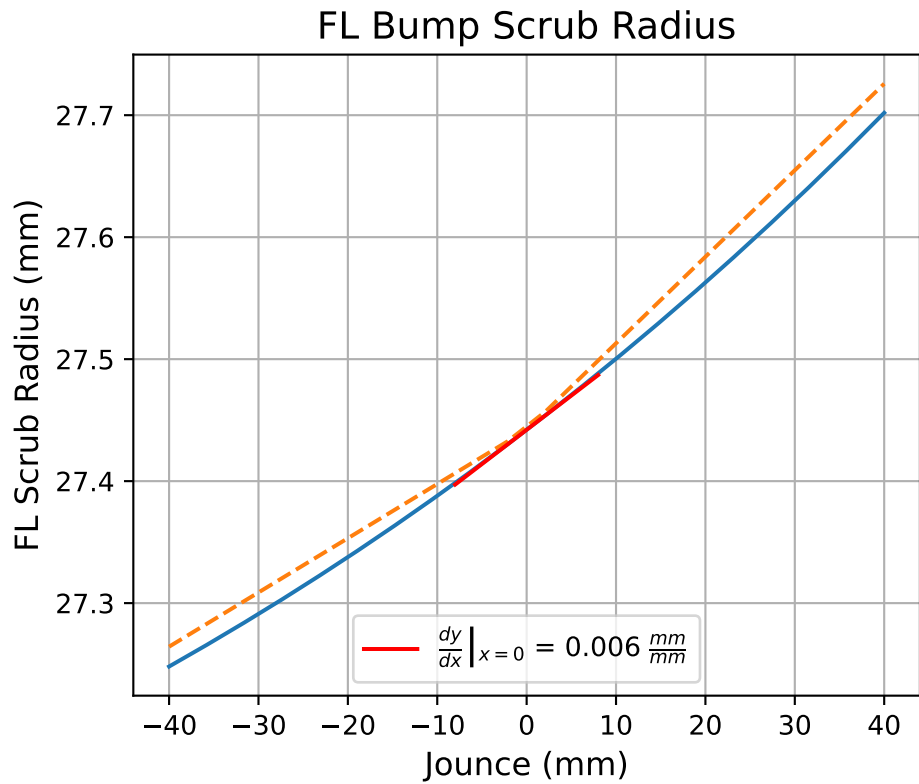
$$f(x) = a_1x + a_0$$

FL	$f(x) = -0.001x + 4.897$
FR	$f(x) = -0.001x + 4.897$
RL	$f(x) = -0.002x + 7.104$
RR	$f(x) = -0.002x + 7.104$

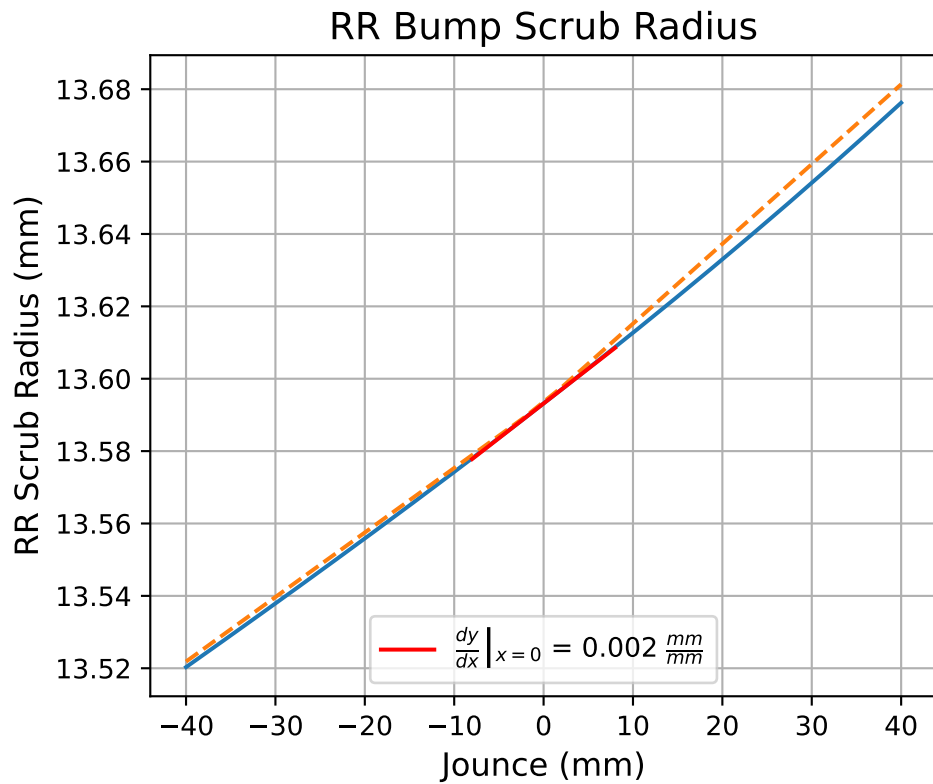
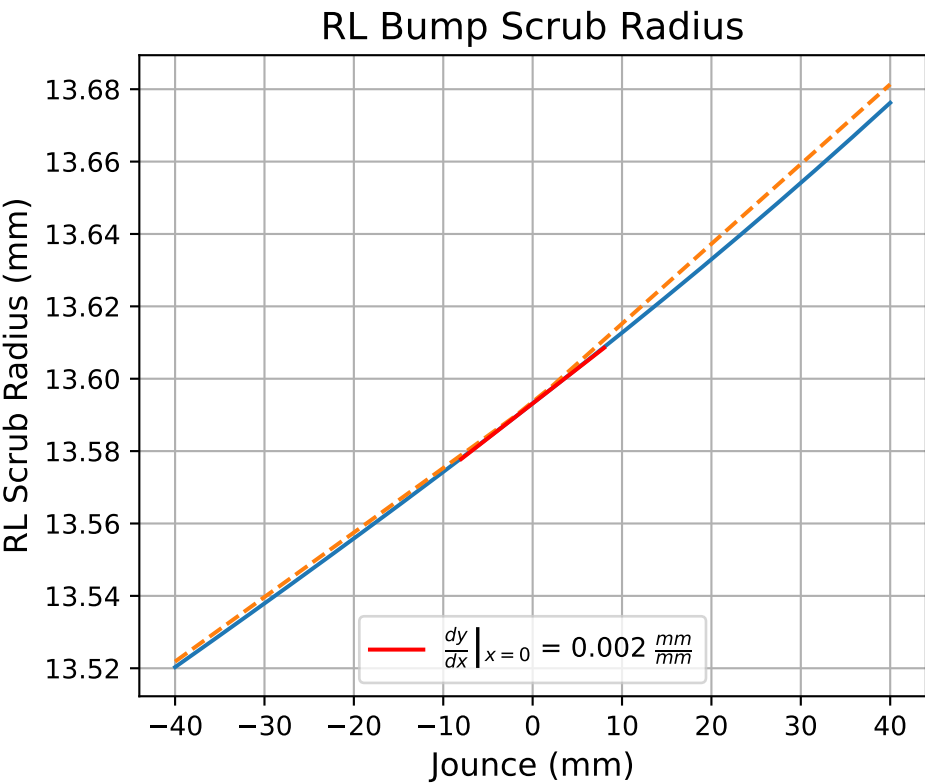
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = 0.0x^3 + -0.0x^2 + -0.001x + 4.897$
FR	$f(x) = 0.0x^3 + -0.0x^2 + -0.001x + 4.897$
RL	$f(x) = -0.0x^3 + 0.0x^2 + -0.002x + 7.104$
RR	$f(x) = -0.0x^3 + 0.0x^2 + -0.002x + 7.104$

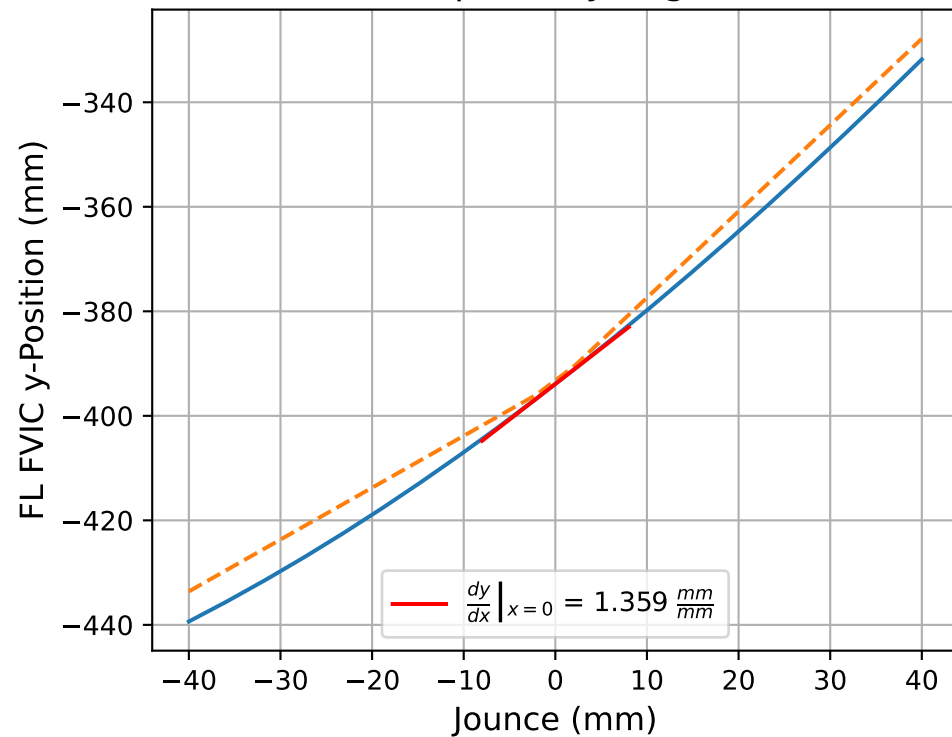


Linear Fit		$f(x) = a_1x + a_0$
FL		$f(x) = 0.006x + 27.442$
FR		$f(x) = 0.006x + 27.442$
RL		$f(x) = 0.002x + 13.593$
RR		$f(x) = 0.002x + 13.593$

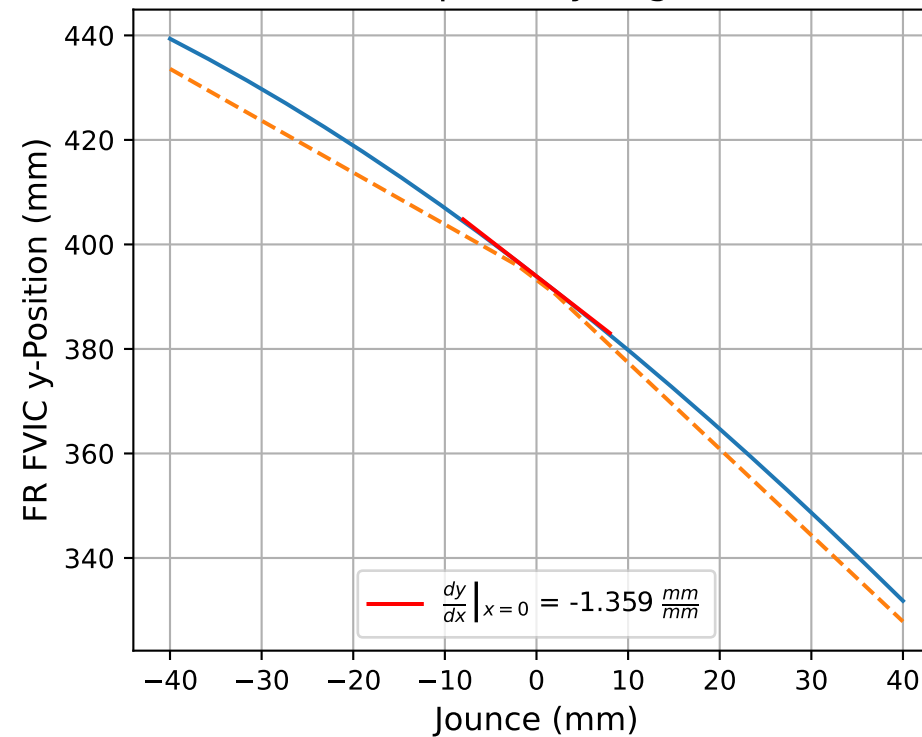


Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL		$f(x) = 0.0x^3 + 0.0x^2 + 0.006x + 27.442$
FR		$f(x) = 0.0x^3 + 0.0x^2 + 0.006x + 27.442$
RL		$f(x) = 0.0x^3 + 0.0x^2 + 0.002x + 13.593$
RR		$f(x) = 0.0x^3 + 0.0x^2 + 0.002x + 13.593$

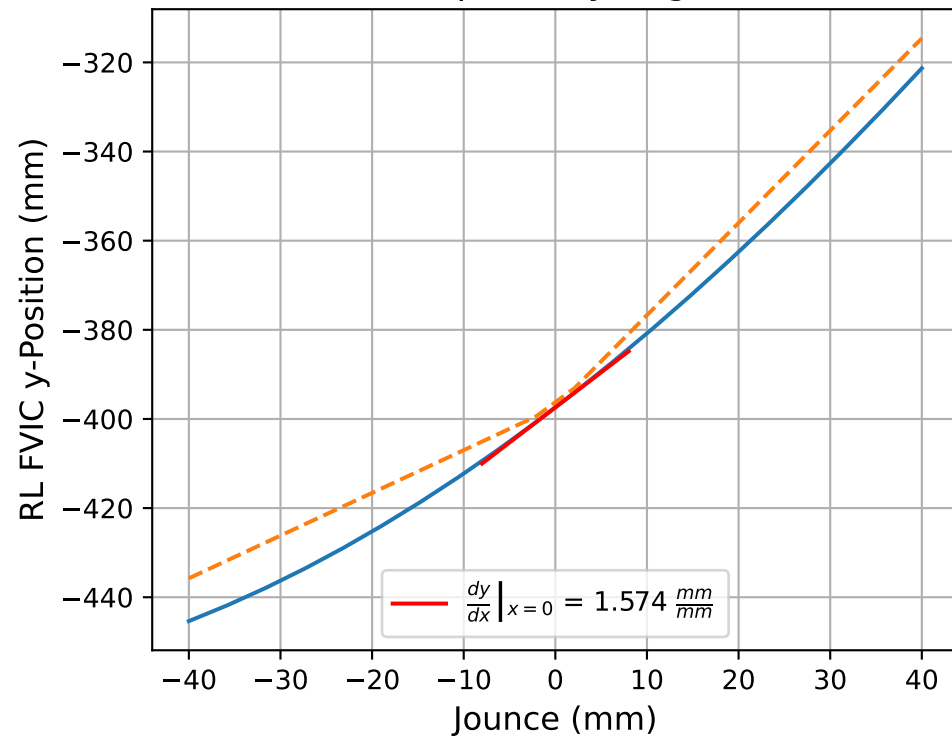
FL Bump FVIC y-Migration



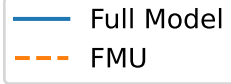
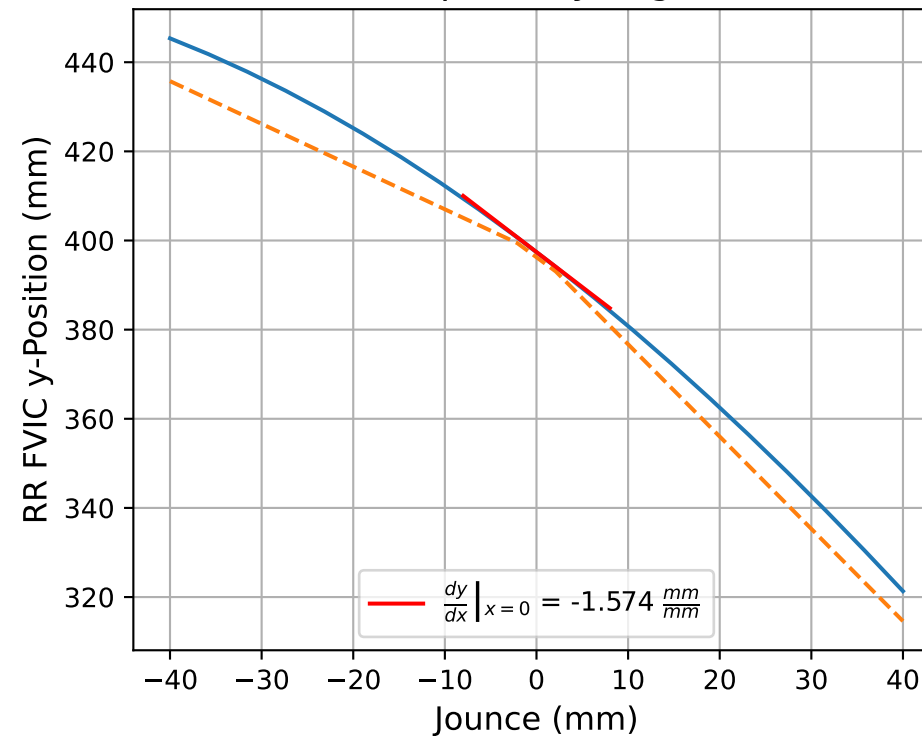
FR Bump FVIC y-Migration



RL Bump FVIC y-Migration



RR Bump FVIC y-Migration



Linear Fit

$$f(x) = a_1x + a_0$$

FL	$f(x) = 1.359x + -393.907$
FR	$f(x) = -1.359x + 393.907$
RL	$f(x) = 1.574x + -397.417$
RR	$f(x) = -1.574x + 397.417$

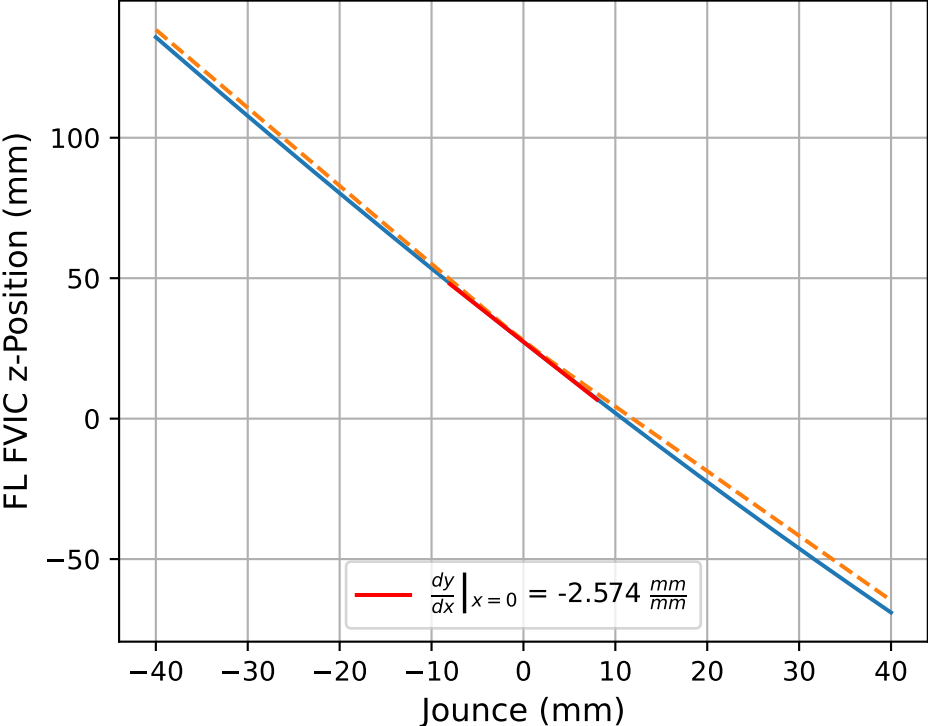
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

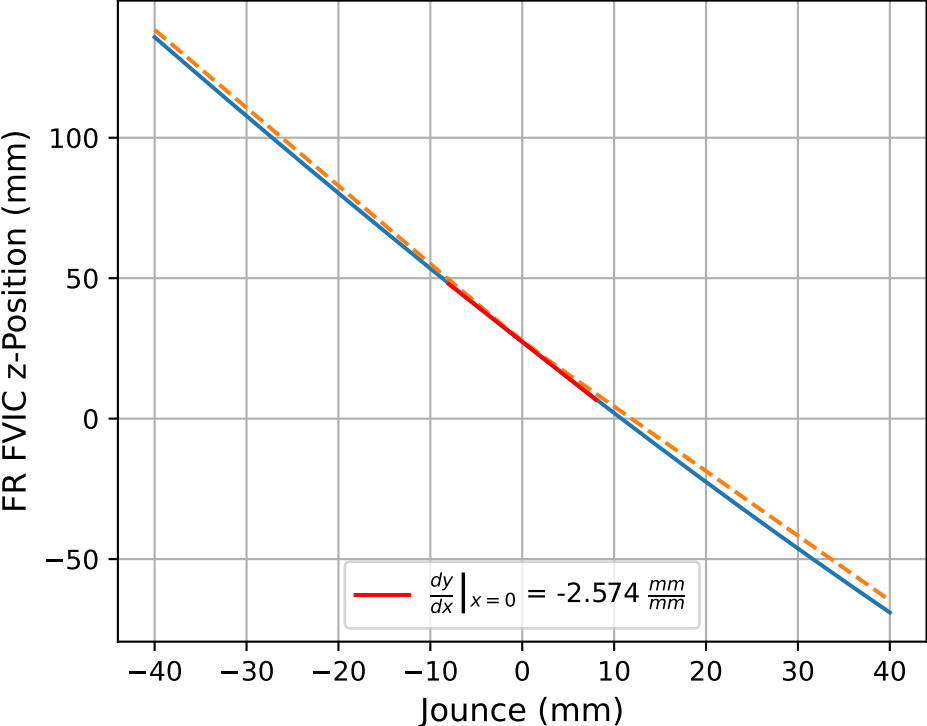
FL	$f(x) = -0.0x^3 + 0.005x^2 + 1.359x + -393.906$
FR	$f(x) = 0.0x^3 + -0.005x^2 + -1.359x + 393.906$
RL	$f(x) = -0.0x^3 + 0.009x^2 + 1.574x + -397.413$
RR	$f(x) = 0.0x^3 + -0.009x^2 + -1.574x + 397.413$



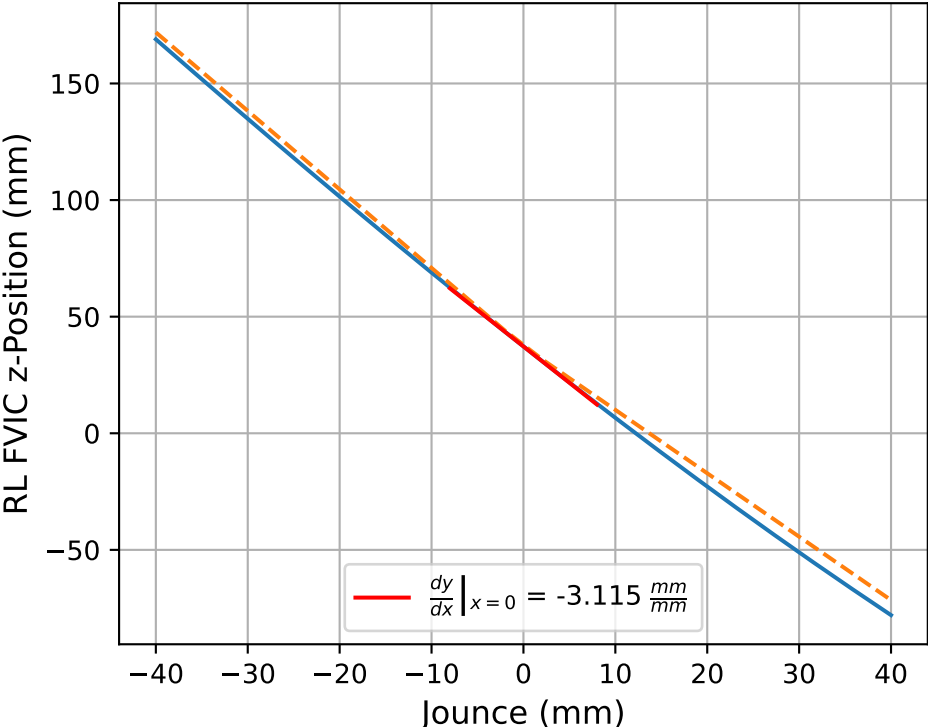
FL Bump FVIC z-Migration



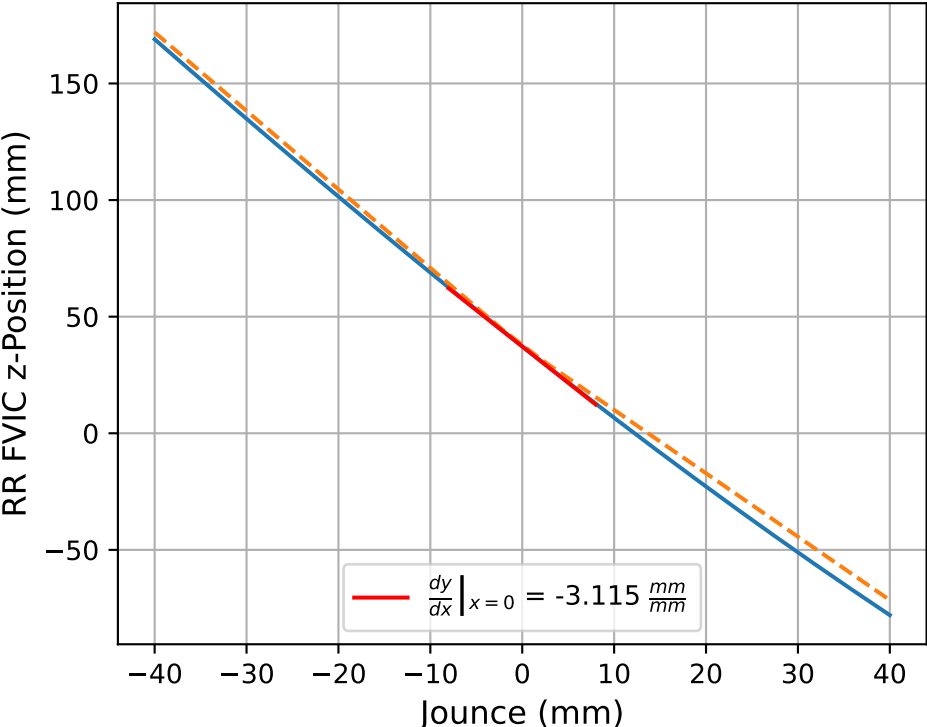
FR Bump FVIC z-Migration



RL Bump FVIC z-Migration



RR Bump FVIC z-Migration



Linear Fit

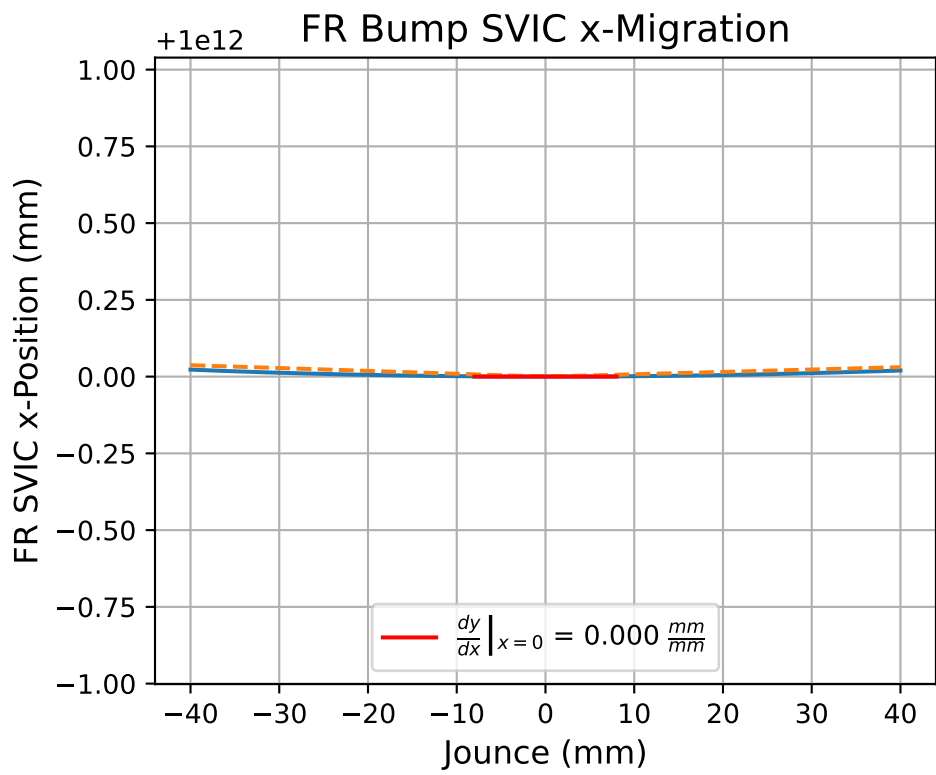
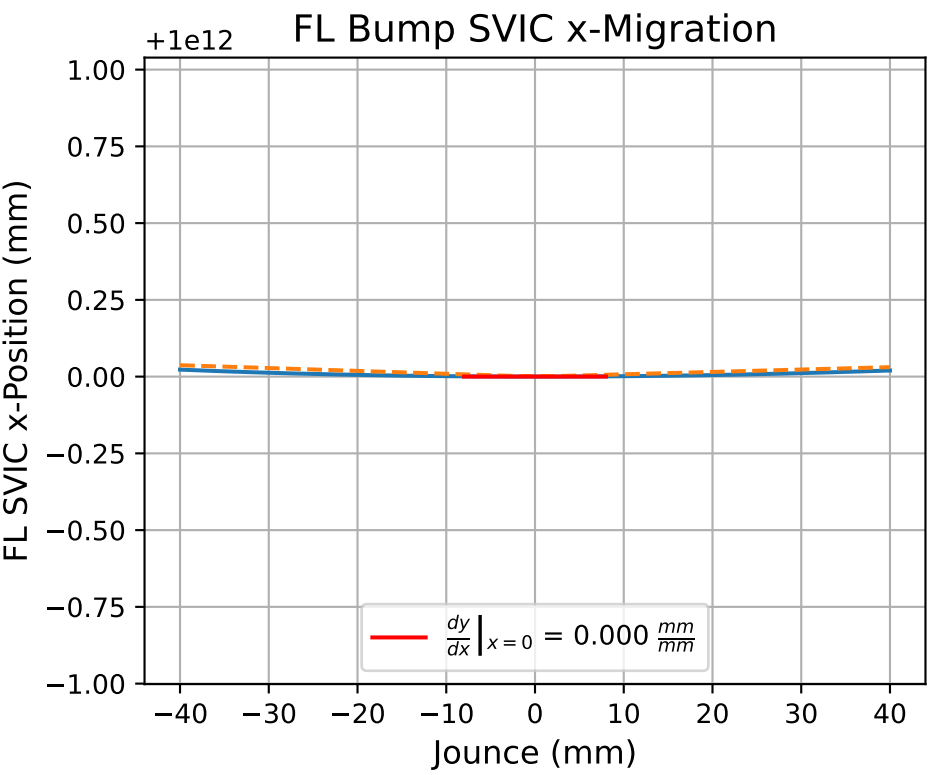
$$f(x) = a_1x + a_0$$

FL	$f(x) = -2.574x + 27.34$
FR	$f(x) = -2.574x + 27.34$
RL	$f(x) = -3.115x + 37.239$
RR	$f(x) = -3.115x + 37.239$

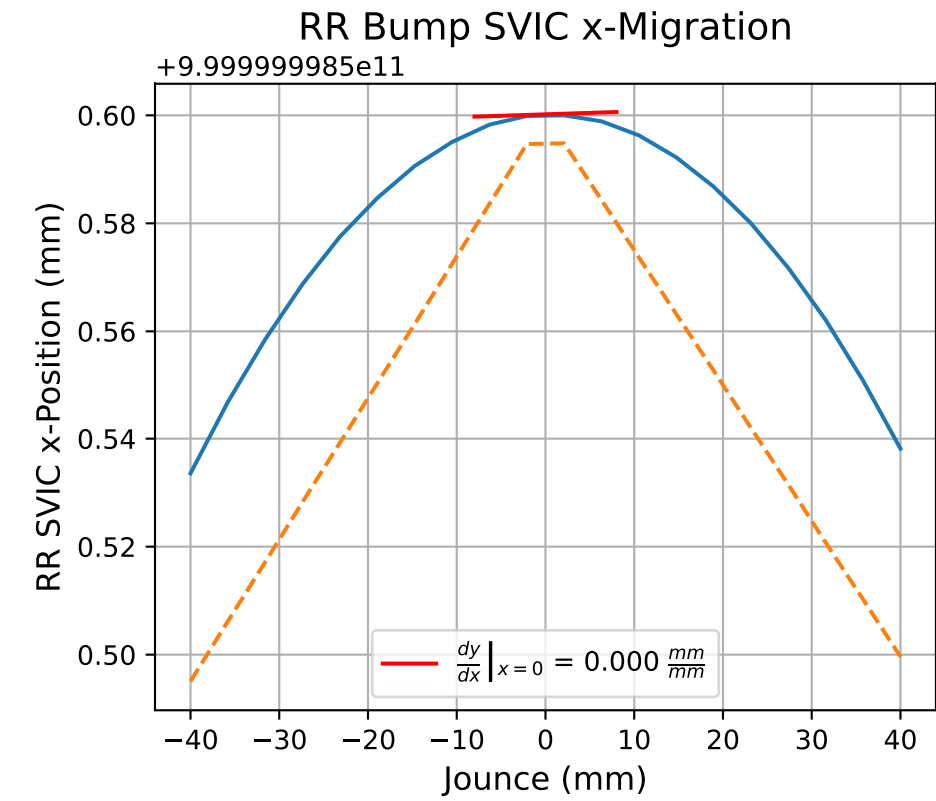
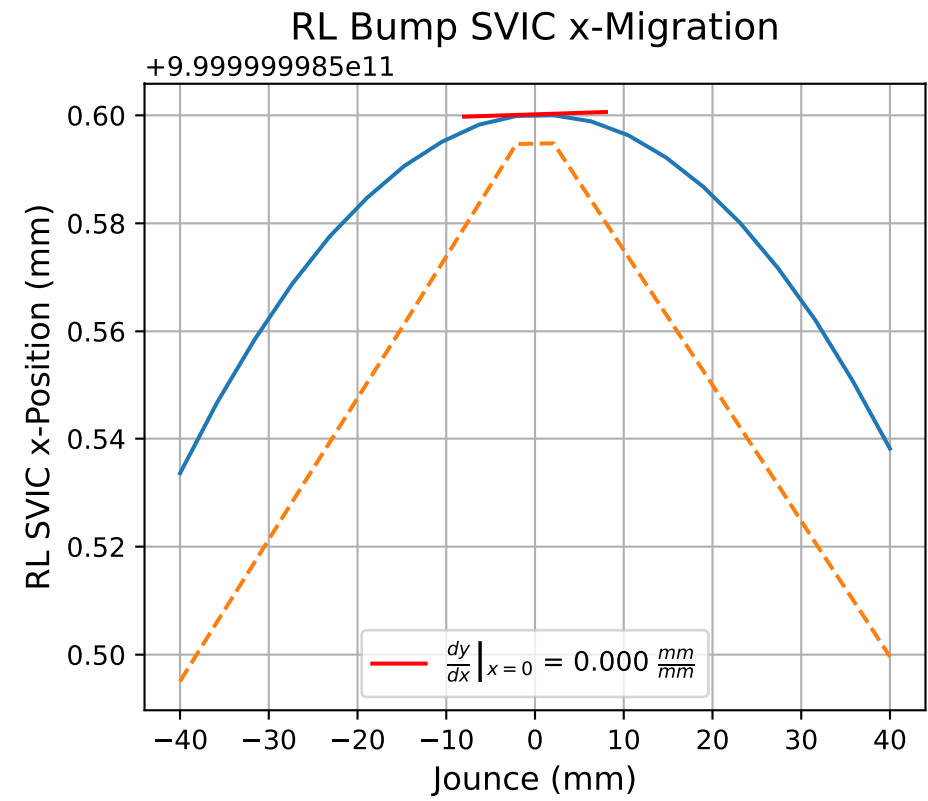
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

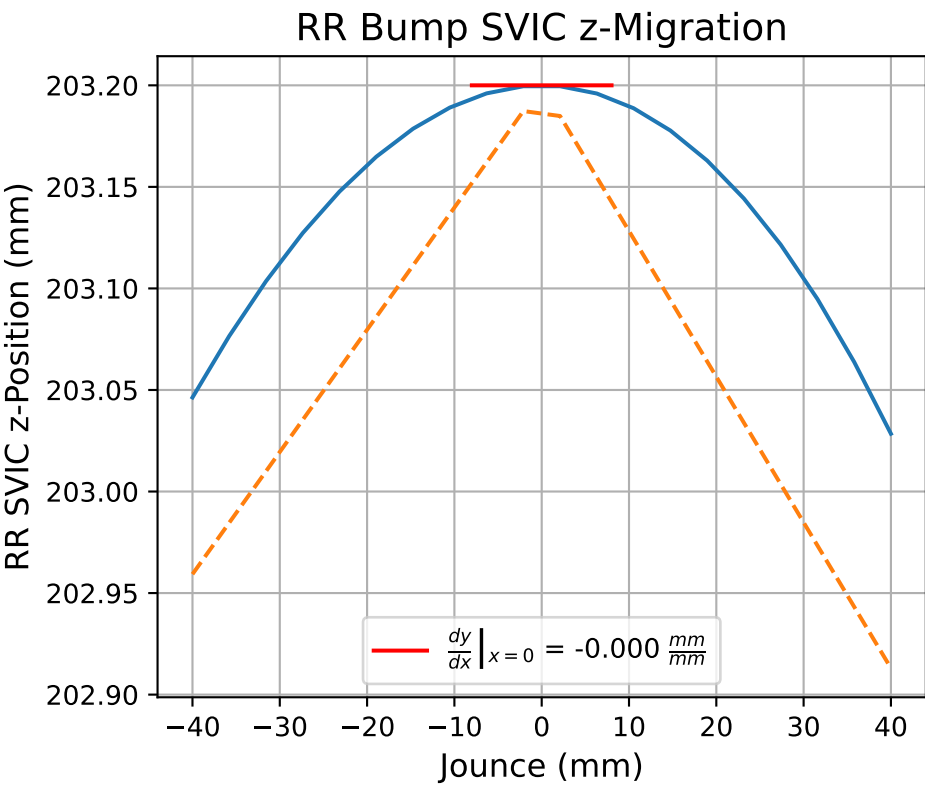
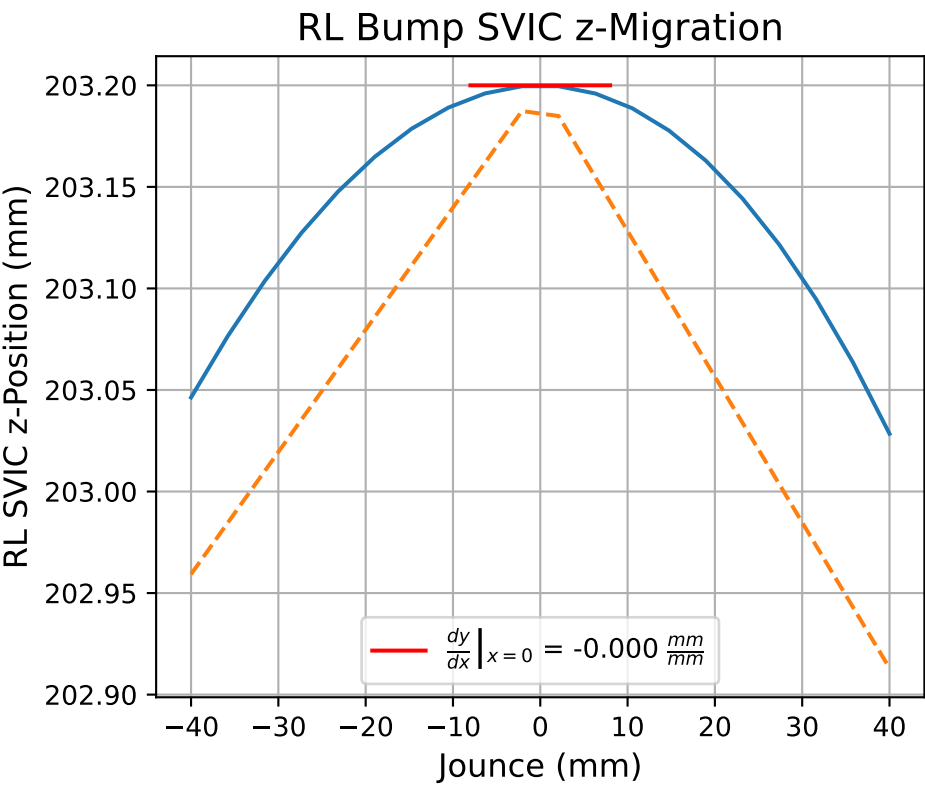
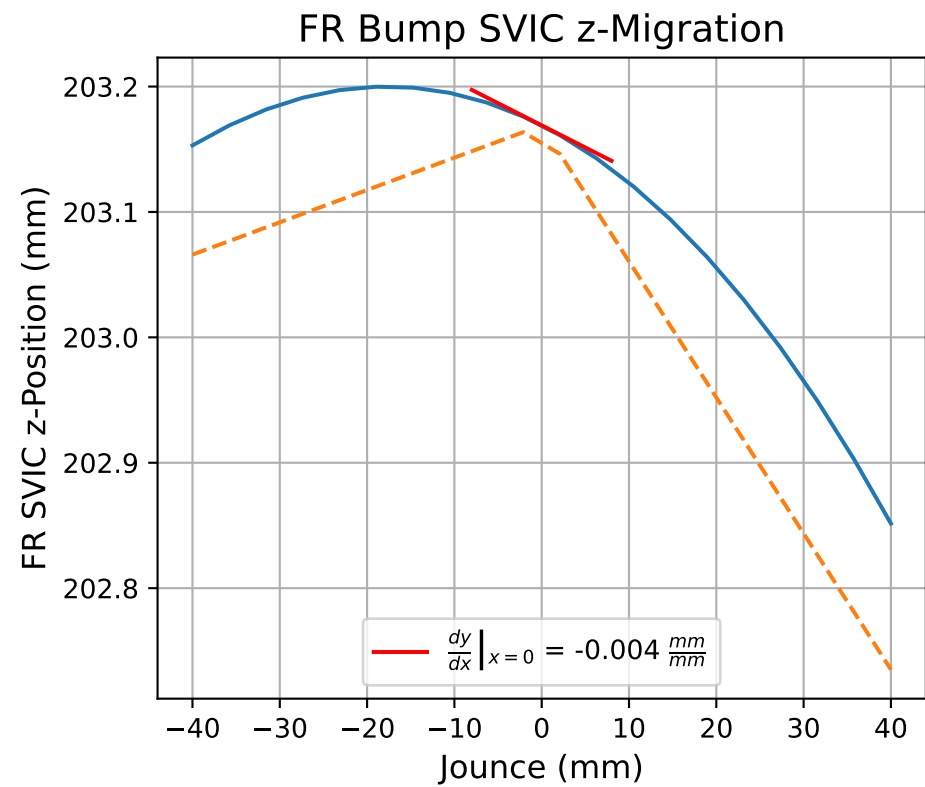
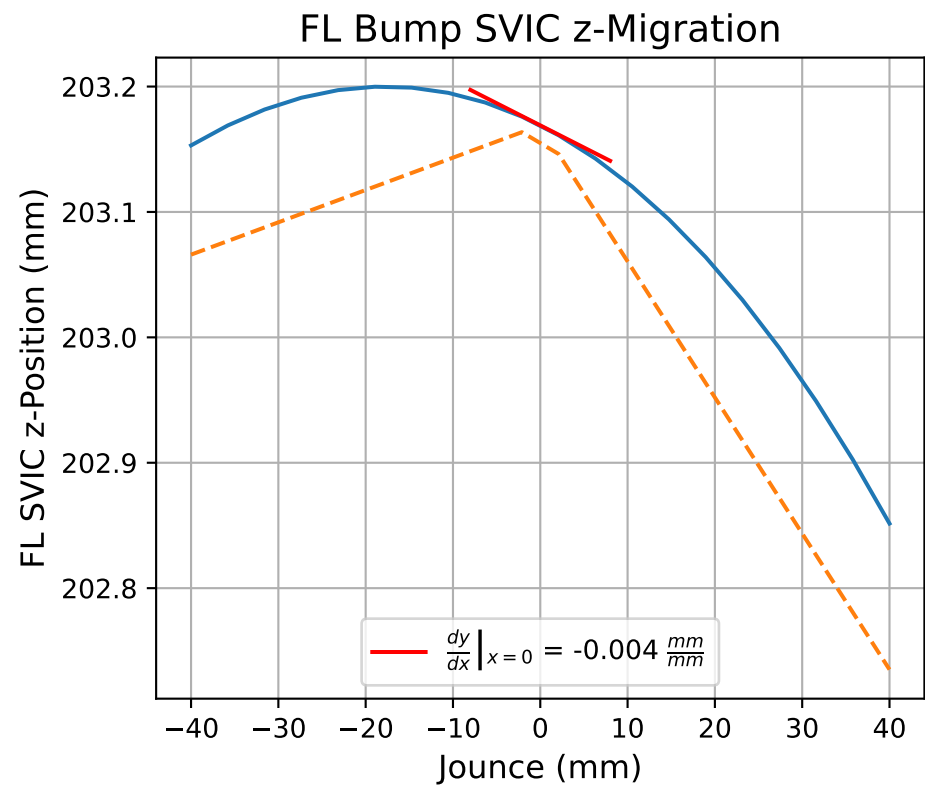
FL	$f(x) = 0.0x^3 + 0.004x^2 + -2.574x + 27.343$
FR	$f(x) = 0.0x^3 + 0.004x^2 + -2.574x + 27.343$
RL	$f(x) = 0.0x^3 + 0.005x^2 + -3.115x + 37.245$
RR	$f(x) = 0.0x^3 + 0.005x^2 + -3.115x + 37.245$



Linear Fit		$f(x) = a_1x + a_0$
FL		$f(x) = 0.0x + 1.000e+12$
FR		$f(x) = 0.0x + 1.000e+12$
RL		$f(x) = 0.0x + 1.000e+12$
RR		$f(x) = 0.0x + 1.000e+12$

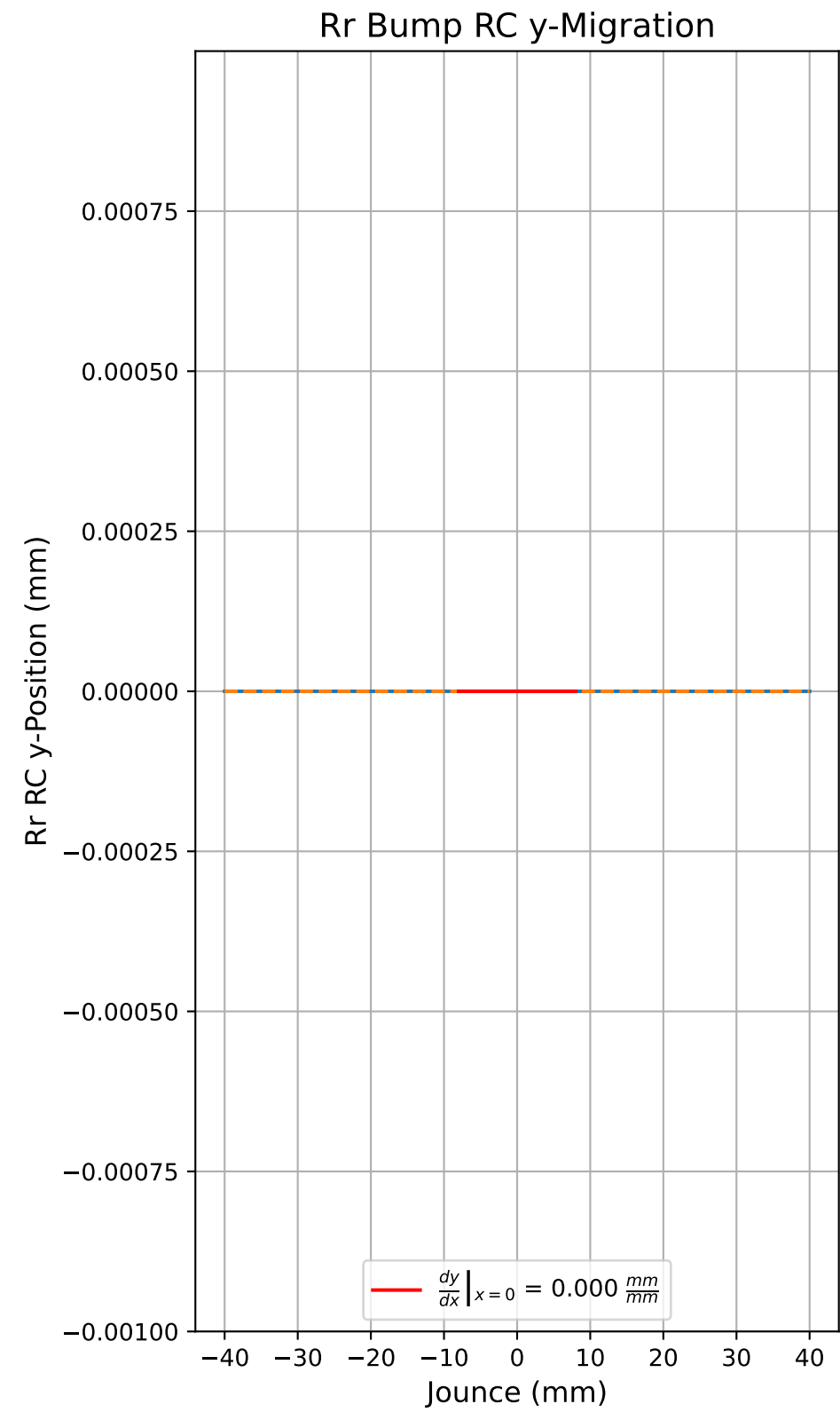
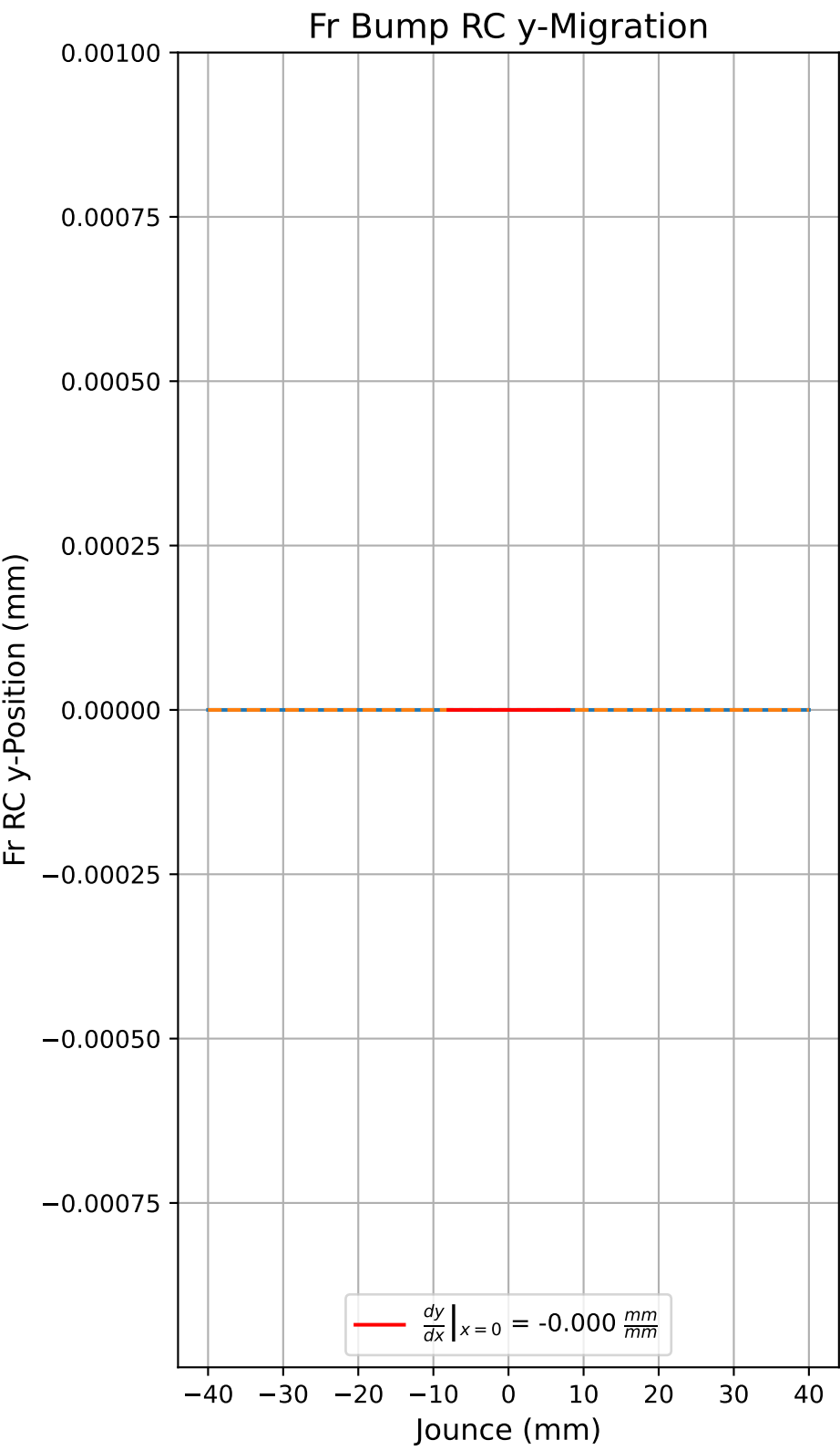


Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL		$f(x) = 0.0x^3 + 0.0x^2 + -0.0x + 1.0e+12$
FR		$f(x) = 0.0x^3 + 0.0x^2 + -0.0x + 1.0e+12$
RL		$f(x) = 0.0x^3 + -0.0x^2 + 0.0x + 1.0e+12$
RR		$f(x) = 0.0x^3 + -0.0x^2 + 0.0x + 1.0e+12$



Linear Fit $f(x) = a_1x + a_0$	
FL	$f(x) = -0.004x + 203.169$
FR	$f(x) = -0.004x + 203.169$
RL	$f(x) = -0.0x + 203.2$
RR	$f(x) = -0.0x + 203.2$

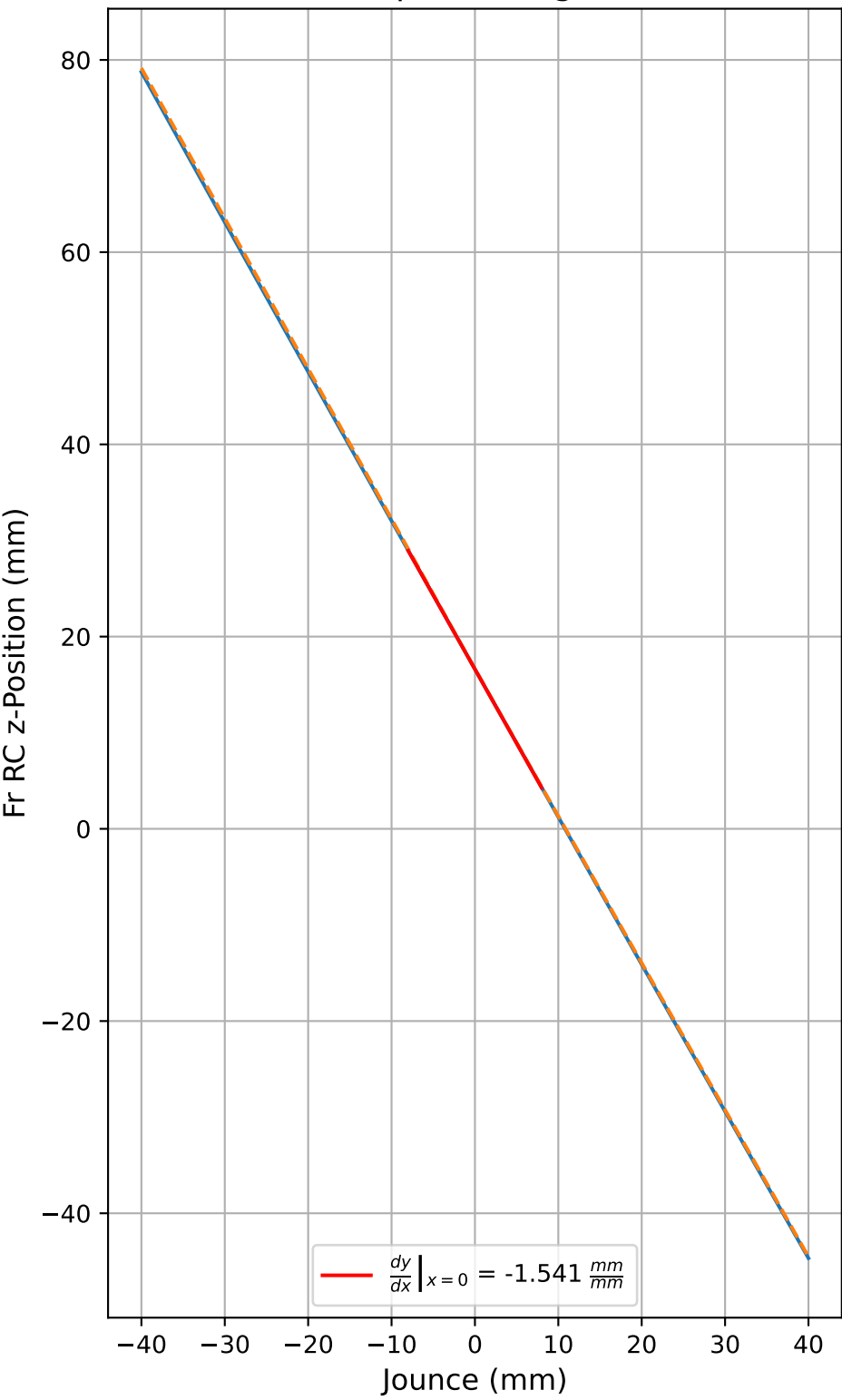
Cubic Fit $f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$	
FL	$f(x) = -0.0x^3 + -0.0x^2 + -0.004x + 203.169$
FR	$f(x) = -0.0x^3 + -0.0x^2 + -0.004x + 203.169$
RL	$f(x) = -0.0x^3 + -0.0x^2 + 0.0x + 203.2$
RR	$f(x) = -0.0x^3 + -0.0x^2 + 0.0x + 203.2$



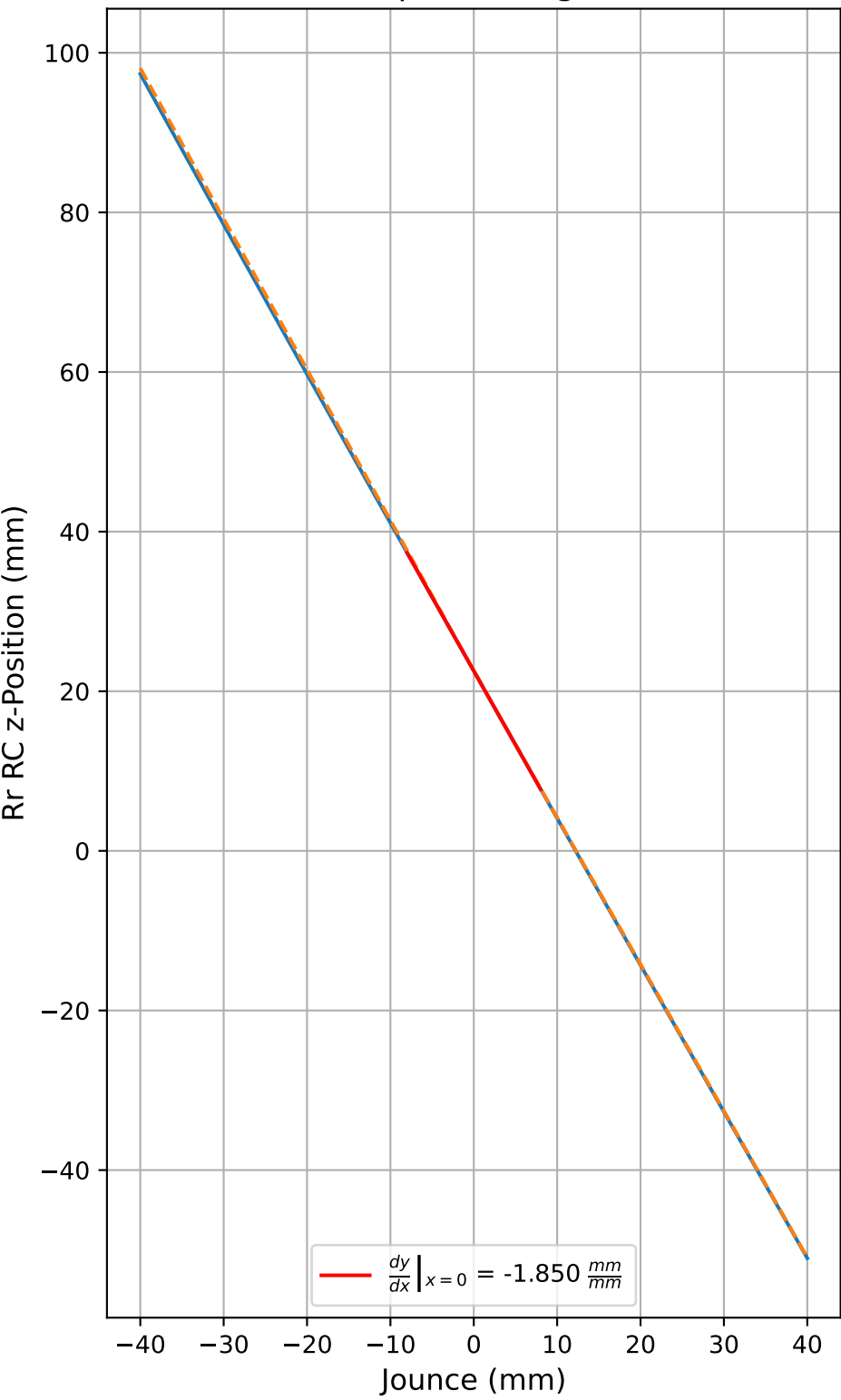
Linear Fit		$f(x) = a_1x + a_0$
Fr		$f(x) = -0.0x + -0.0$
Rr		$f(x) = 0.0x + -0.0$

Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
Fr		$f(x) = -0.0x^3 + -0.0x^2 + 0.0x + 0.0$
Rr		$f(x) = 0.0x^3 + 0.0x^2 + -0.0x + -0.0$

Fr Bump RC z-Migration



Rr Bump RC z-Migration



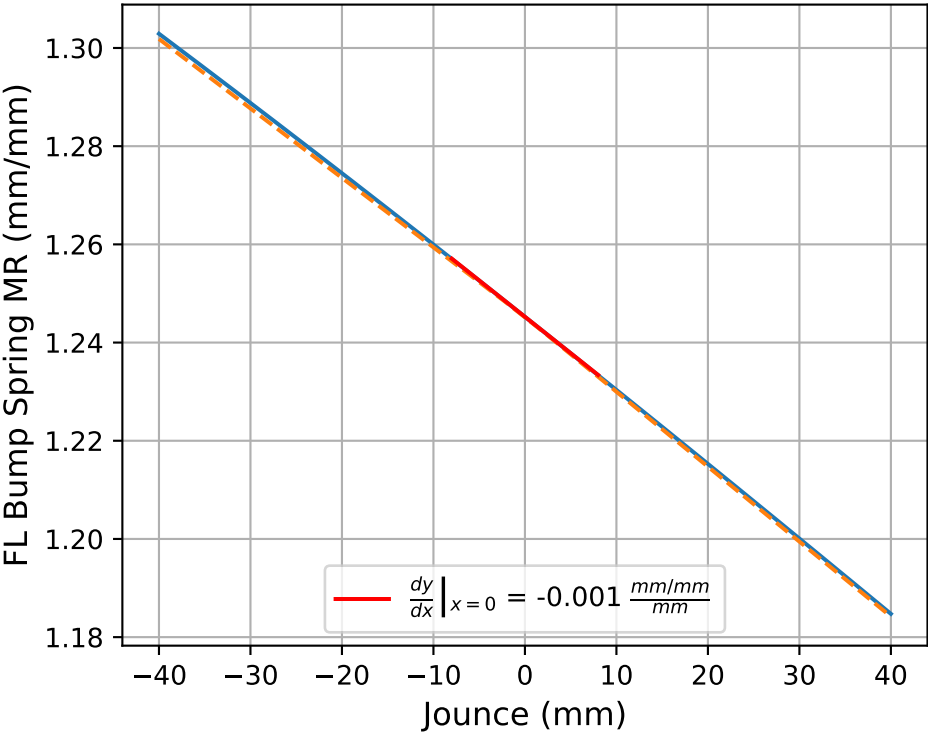
Full Model
FMU

Linear Fit		$f(x) = a_1x + a_0$
Fr		$f(x) = -1.541x + 16.608$
Rr		$f(x) = -1.85x + 22.543$

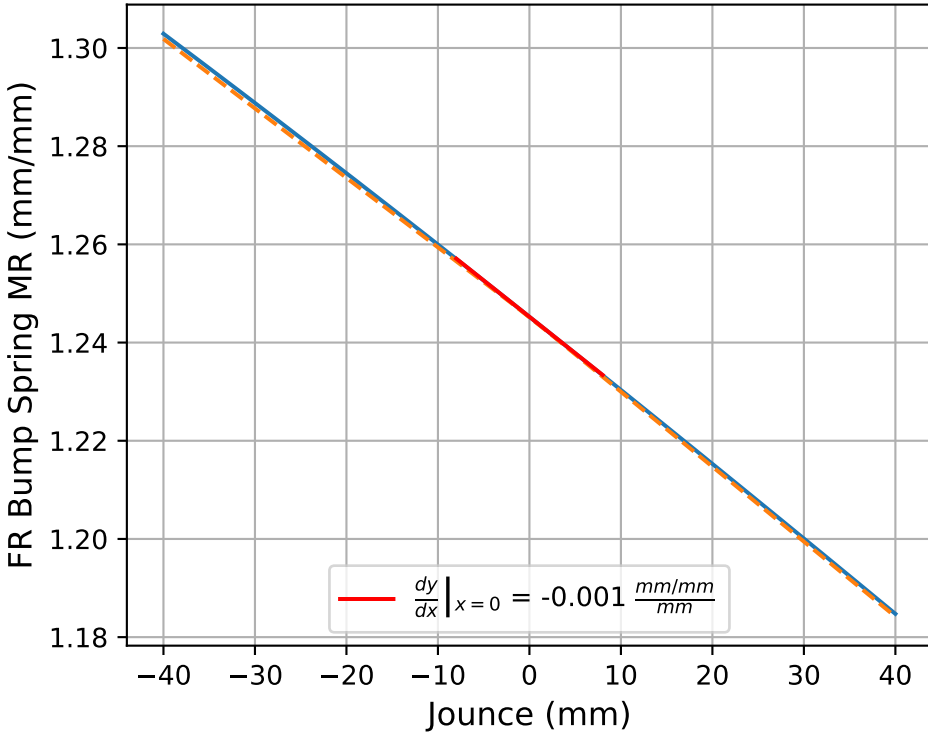
Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
Fr		$f(x) = -0.0x^3 + 0.0x^2 + -1.541x + 16.607$
Rr		$f(x) = -0.0x^3 + 0.0x^2 + -1.85x + 22.541$



FL Bump Spring MRs



FR Bump Spring MRs

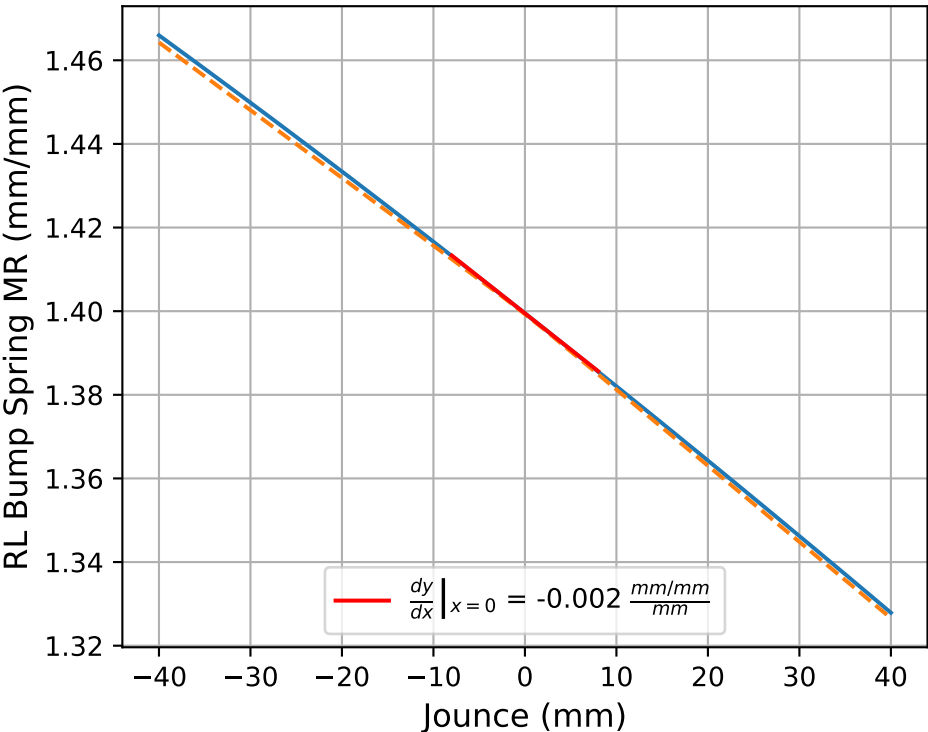


Linear Fit

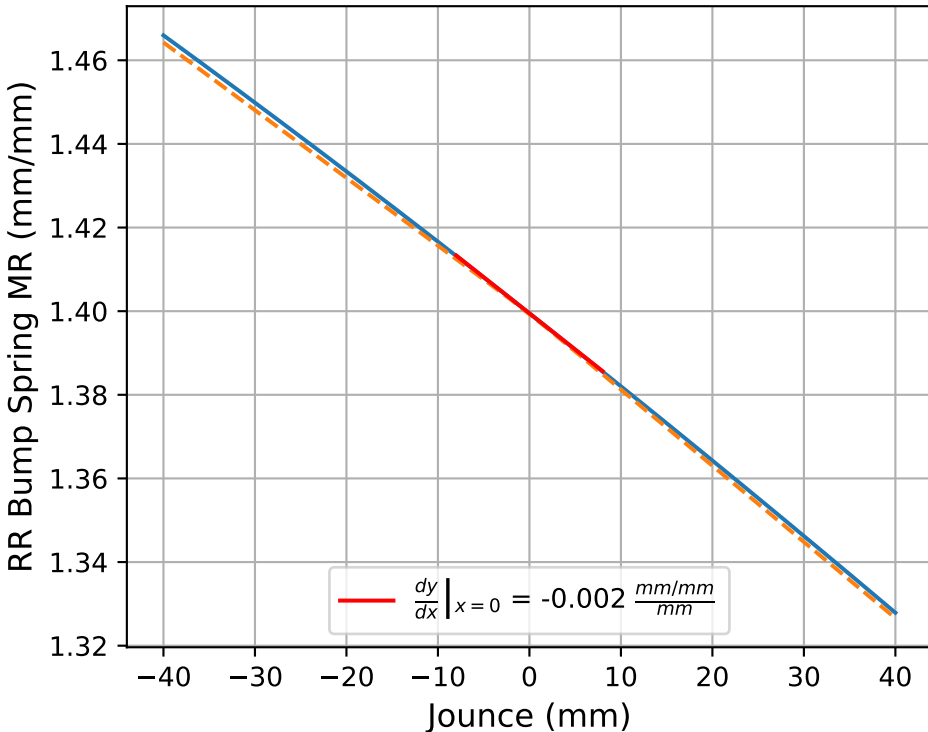
$$f(x) = a_1x + a_0$$

FL	$f(x) = -0.001x + 1.245$
FR	$f(x) = -0.001x + 1.245$
RL	$f(x) = -0.002x + 1.399$
RR	$f(x) = -0.002x + 1.399$

RL Bump Spring MRs



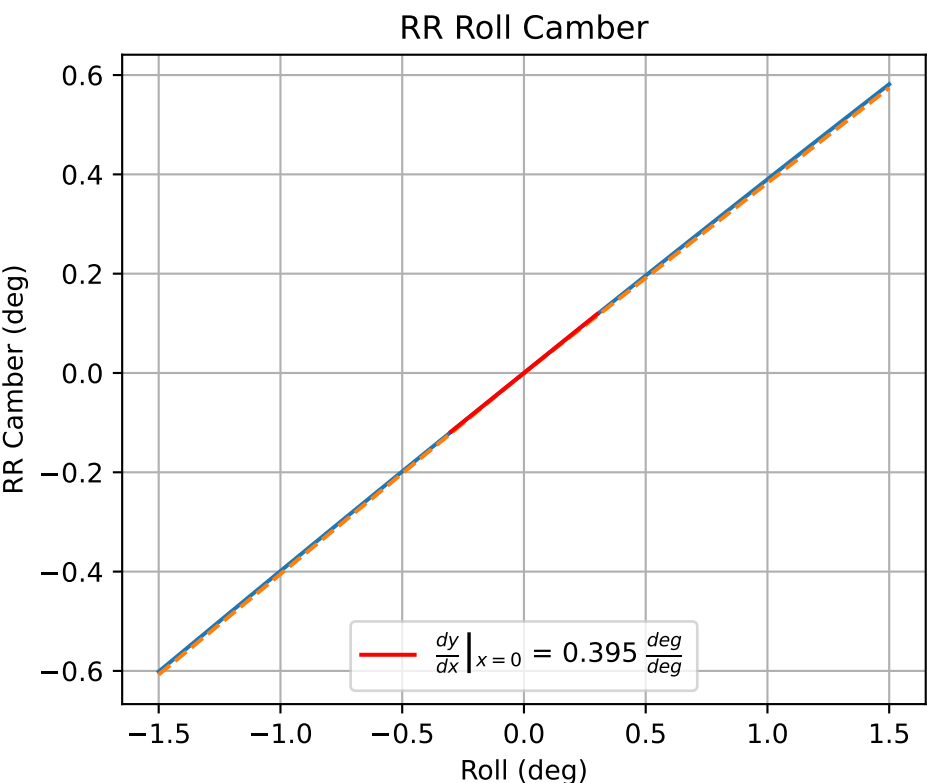
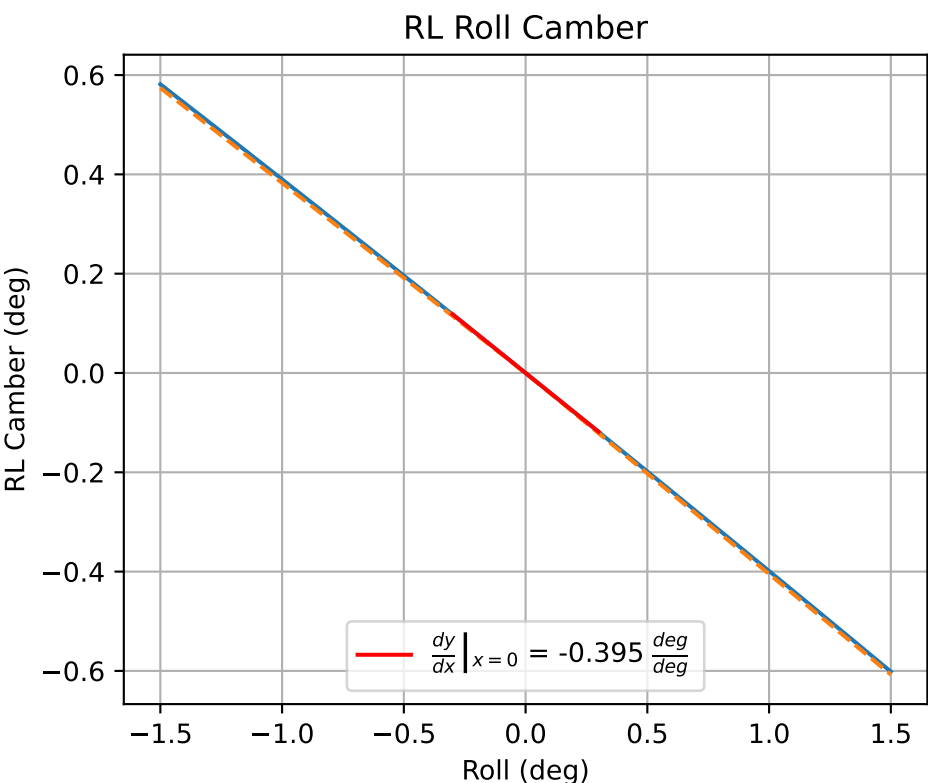
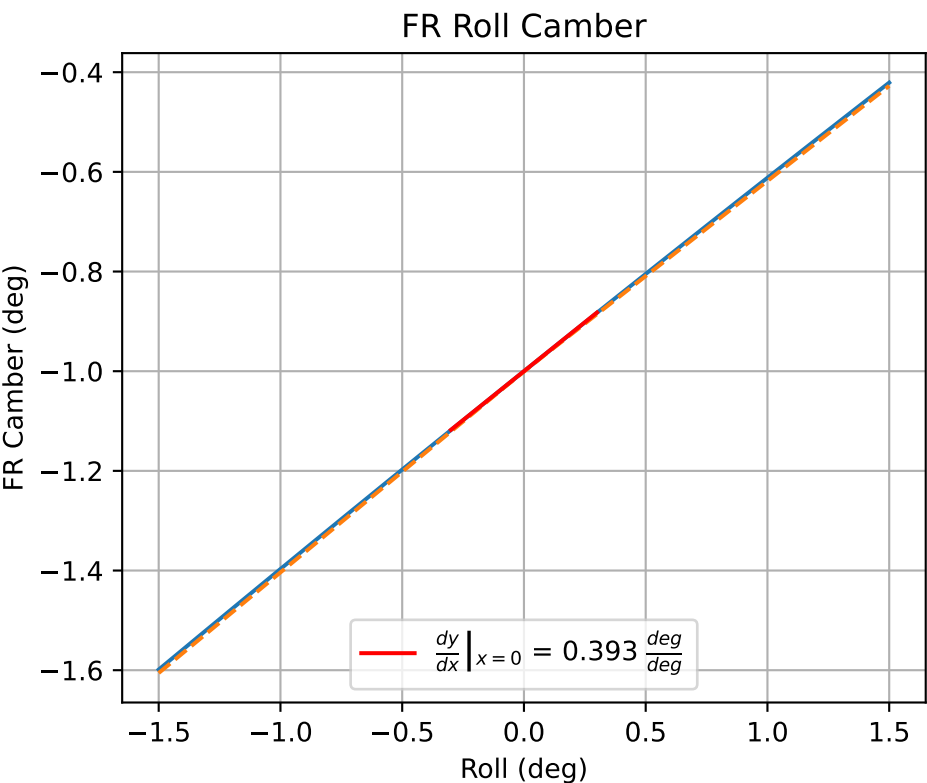
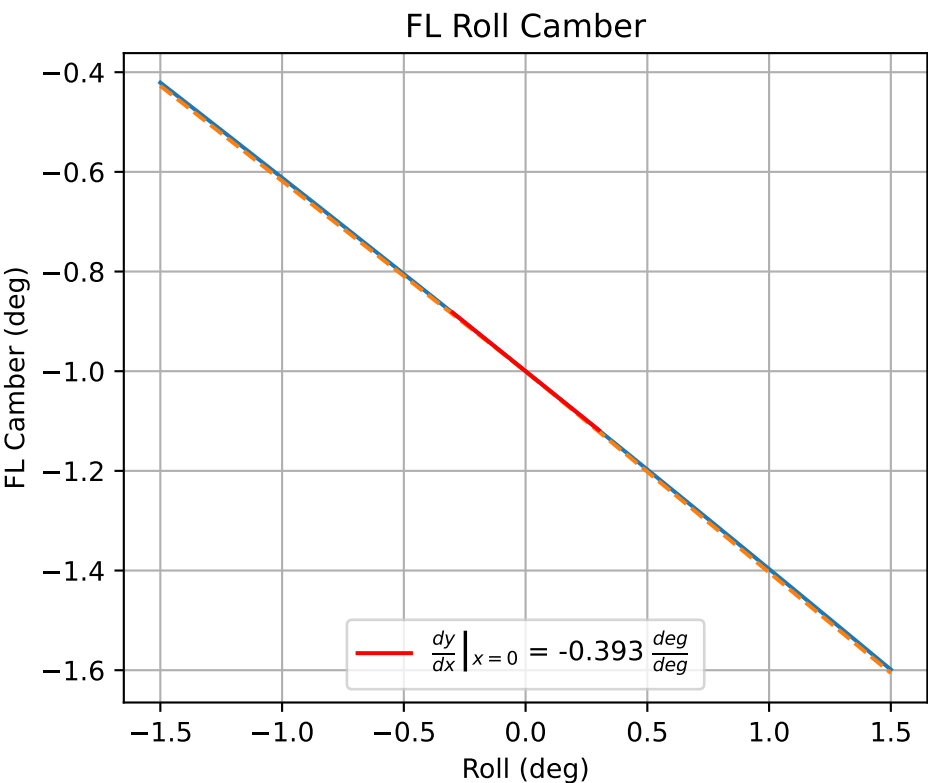
RR Bump Spring MRs



Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = 0.0x^3 + -0.0x^2 + -0.001x + 1.245$
FR	$f(x) = 0.0x^3 + -0.0x^2 + -0.001x + 1.245$
RL	$f(x) = 0.0x^3 + -0.0x^2 + -0.002x + 1.399$
RR	$f(x) = 0.0x^3 + -0.0x^2 + -0.002x + 1.399$

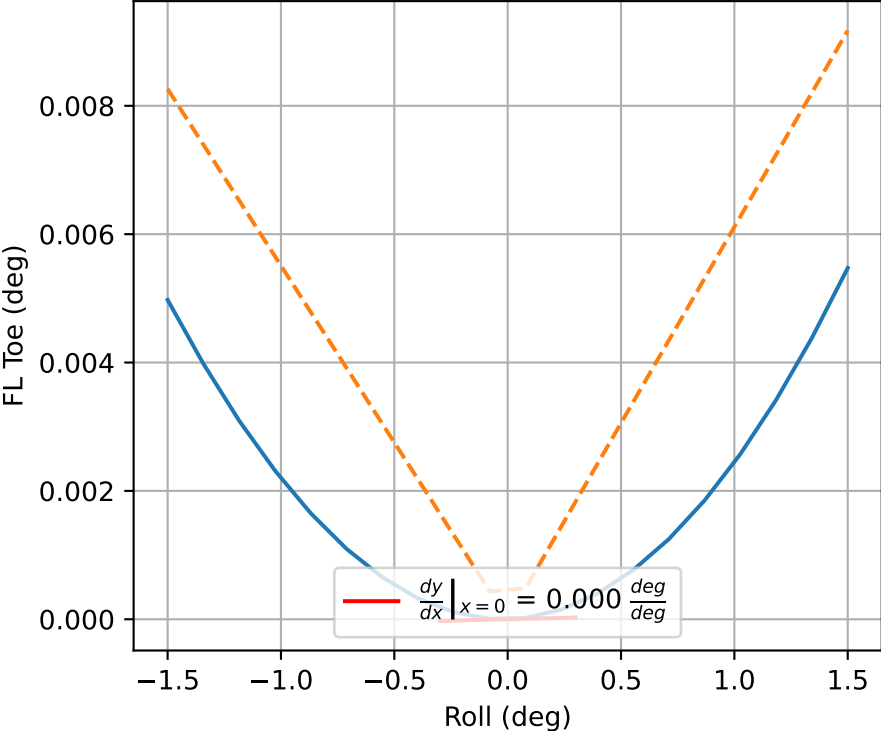


Linear Fit		$f(x) = a_1x + a_0$
FL		$f(x) = -0.393x + -1.0$
FR		$f(x) = 0.393x + -1.0$
RL		$f(x) = -0.395x + 0.0$
RR		$f(x) = 0.395x + 0.0$

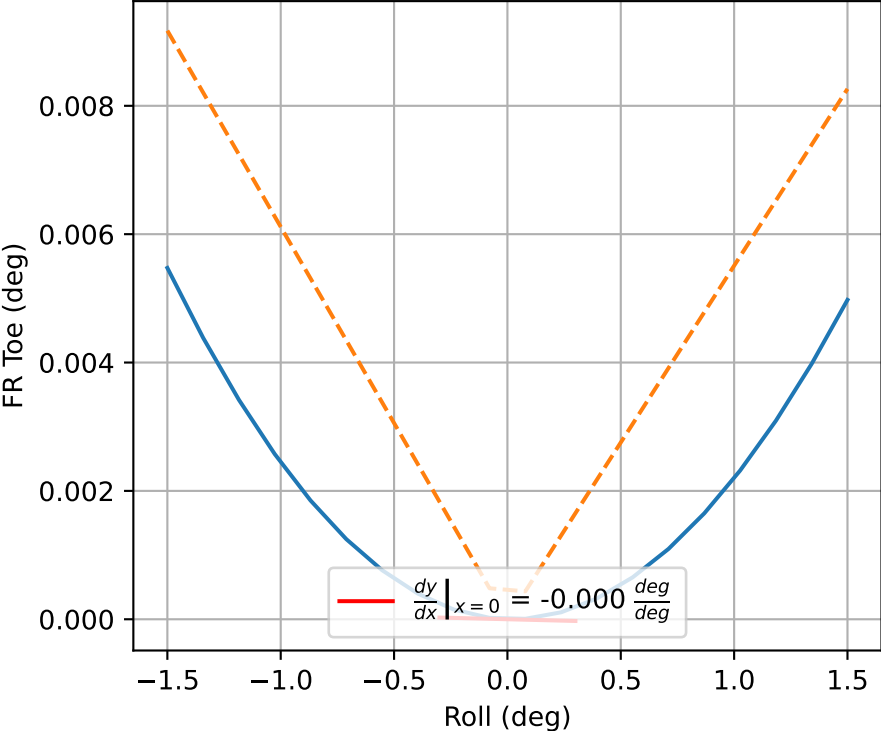
Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL		$f(x) = -0.0x^3 + -0.004x^2 + -0.393x + -1.0$
FR		$f(x) = 0.0x^3 + -0.004x^2 + 0.393x + -1.0$
RL		$f(x) = 0.0x^3 + -0.004x^2 + -0.395x + 0.0$
RR		$f(x) = -0.0x^3 + -0.004x^2 + 0.395x + 0.0$



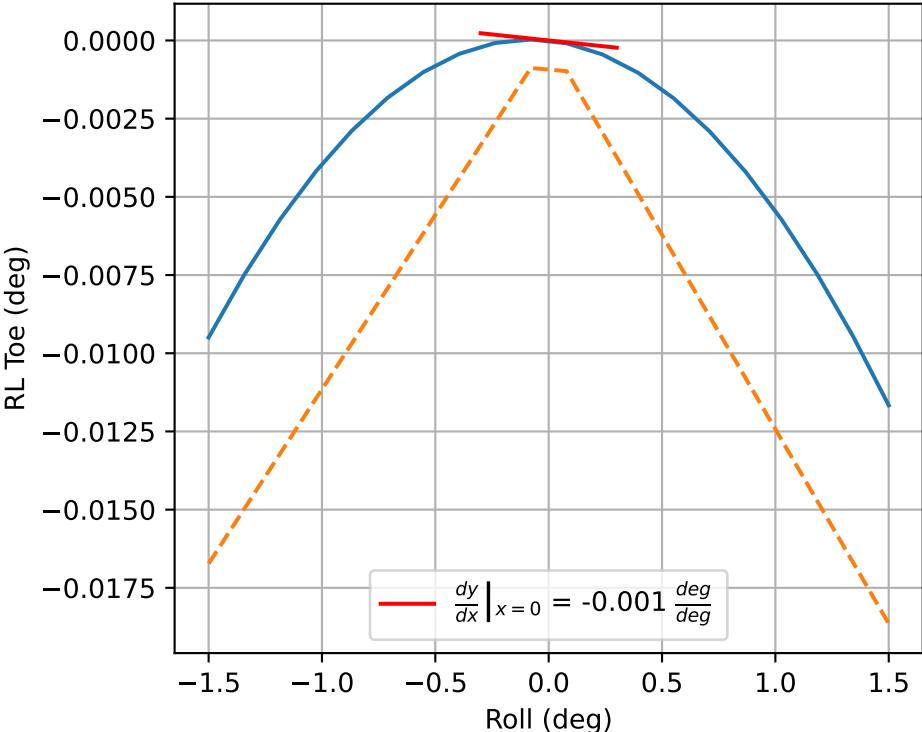
FL Roll Toe



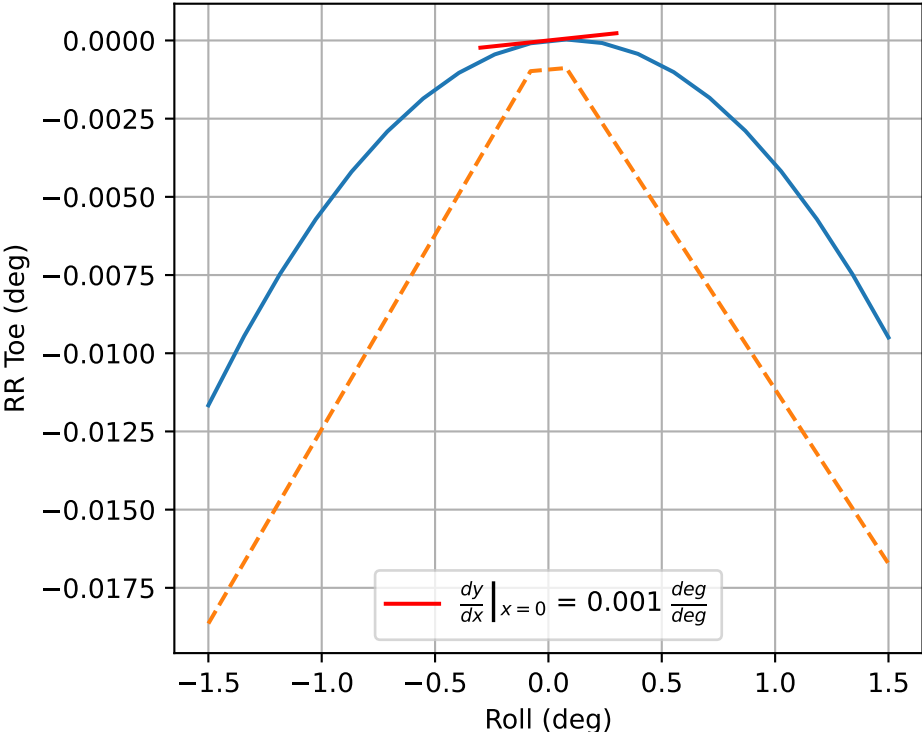
FR Roll Toe



RL Roll Toe



RR Roll Toe



Linear Fit

$$f(x) = a_1x + a_0$$

FL	$f(x) = 0.0x + -0.0$
FR	$f(x) = -0.0x + -0.0$
RL	$f(x) = -0.001x + 0.0$
RR	$f(x) = 0.001x + 0.0$

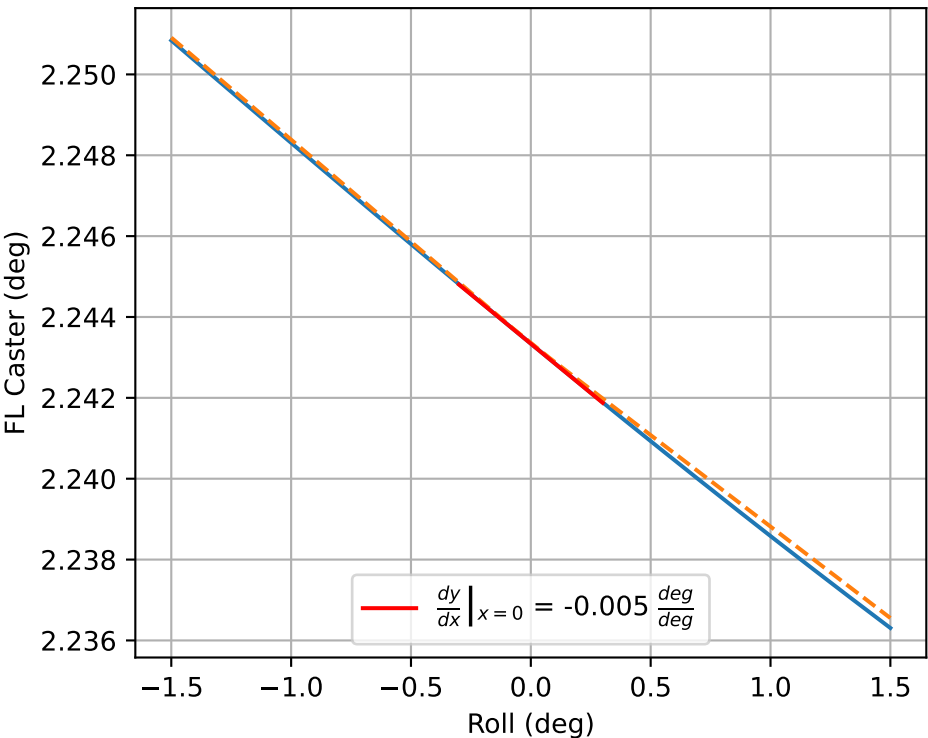
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

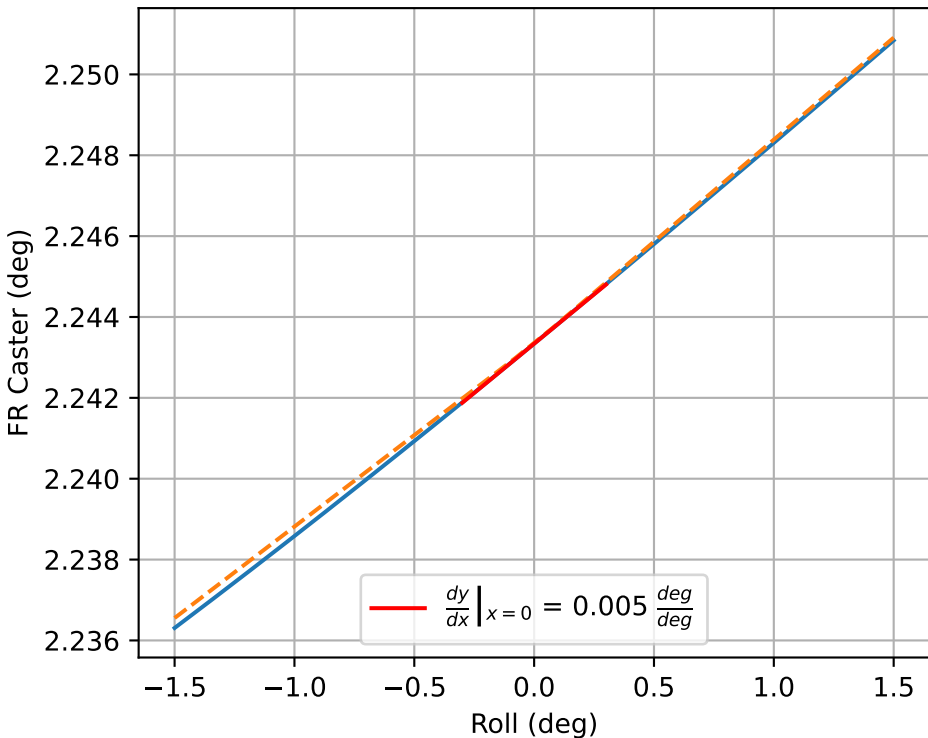
FL	$f(x) = 0.0x^3 + 0.002x^2 + 0.0x + -0.0$
FR	$f(x) = -0.0x^3 + 0.002x^2 + -0.0x + -0.0$
RL	$f(x) = 0.0x^3 + -0.005x^2 + -0.001x + 0.0$
RR	$f(x) = -0.0x^3 + -0.005x^2 + 0.001x + 0.0$



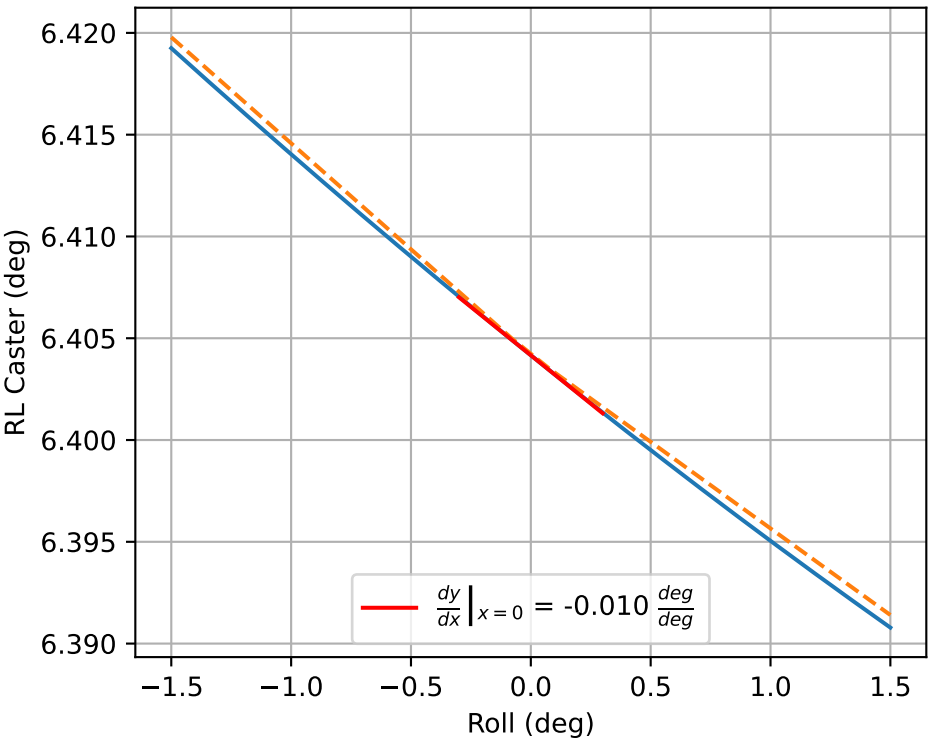
FL Roll Caster



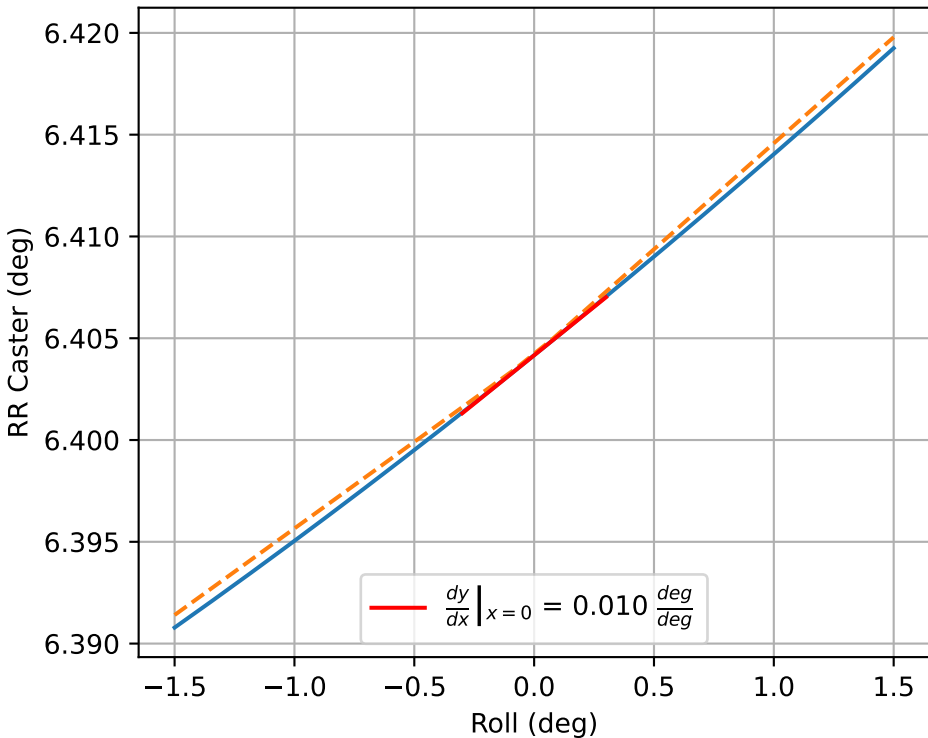
FR Roll Caster



RL Roll Caster



RR Roll Caster



Linear Fit

$$f(x) = a_1x + a_0$$

FL	$f(x) = -0.005x + 2.243$
FR	$f(x) = 0.005x + 2.243$
RL	$f(x) = -0.01x + 6.404$
RR	$f(x) = 0.01x + 6.404$

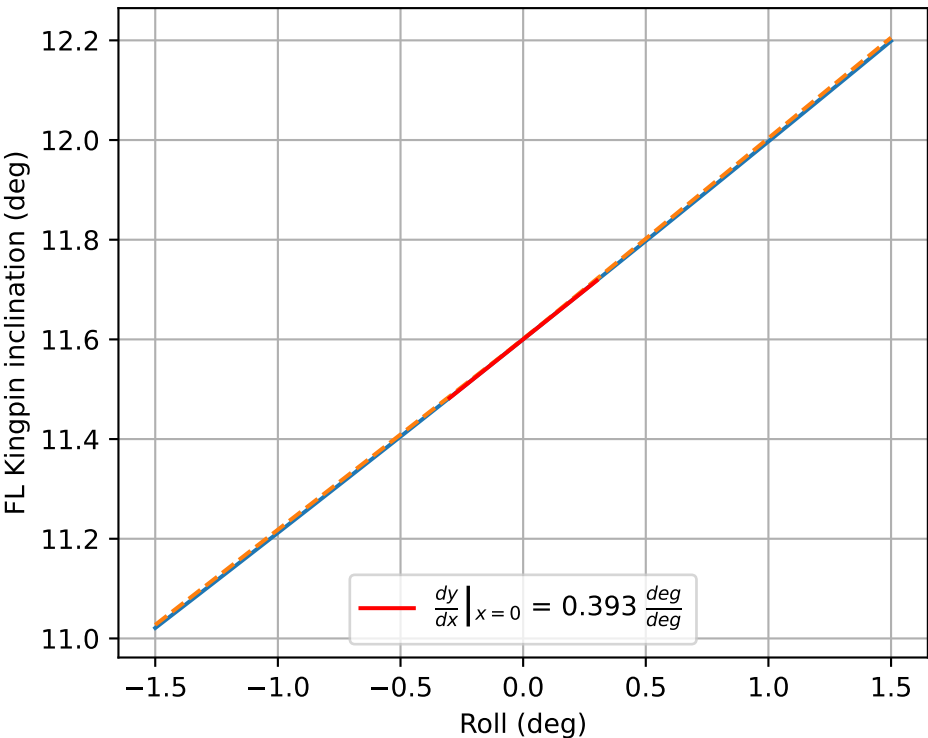
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

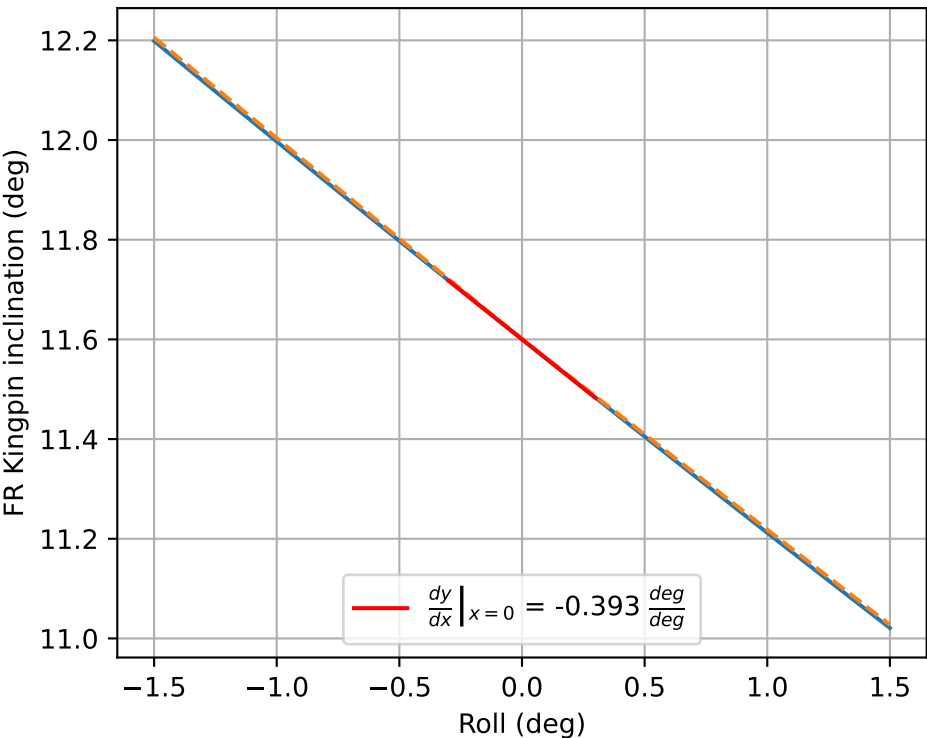
FL	$f(x) = 0.0x^3 + 0.0x^2 + -0.005x + 2.243$
FR	$f(x) = -0.0x^3 + 0.0x^2 + 0.005x + 2.243$
RL	$f(x) = 0.0x^3 + 0.0x^2 + -0.01x + 6.404$
RR	$f(x) = -0.0x^3 + 0.0x^2 + 0.01x + 6.404$



FL Roll KPI



FR Roll KPI

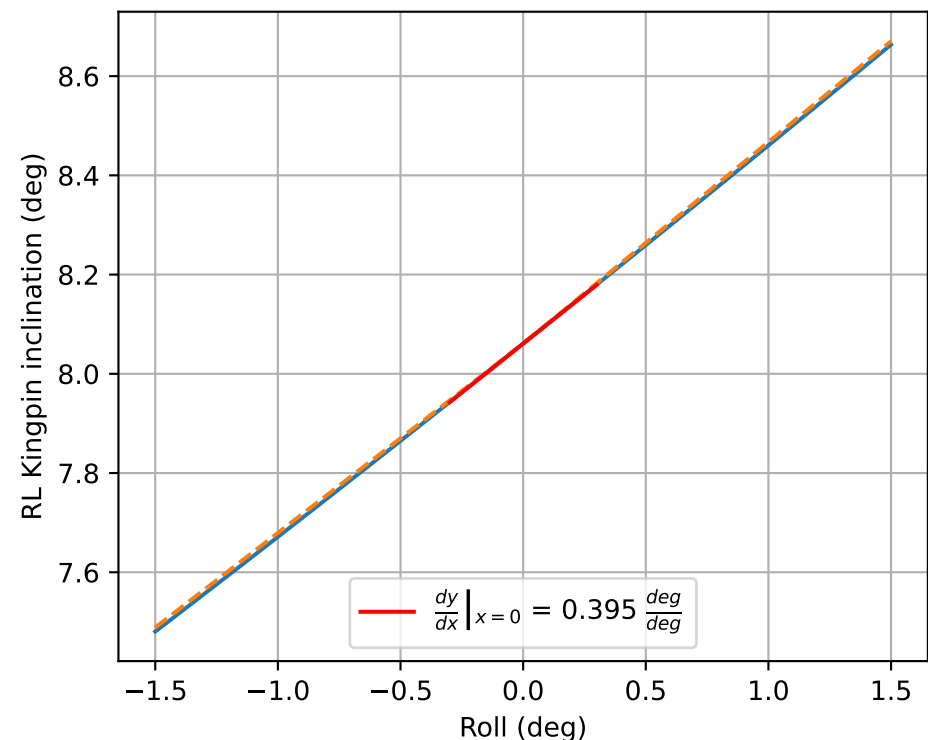


Linear Fit

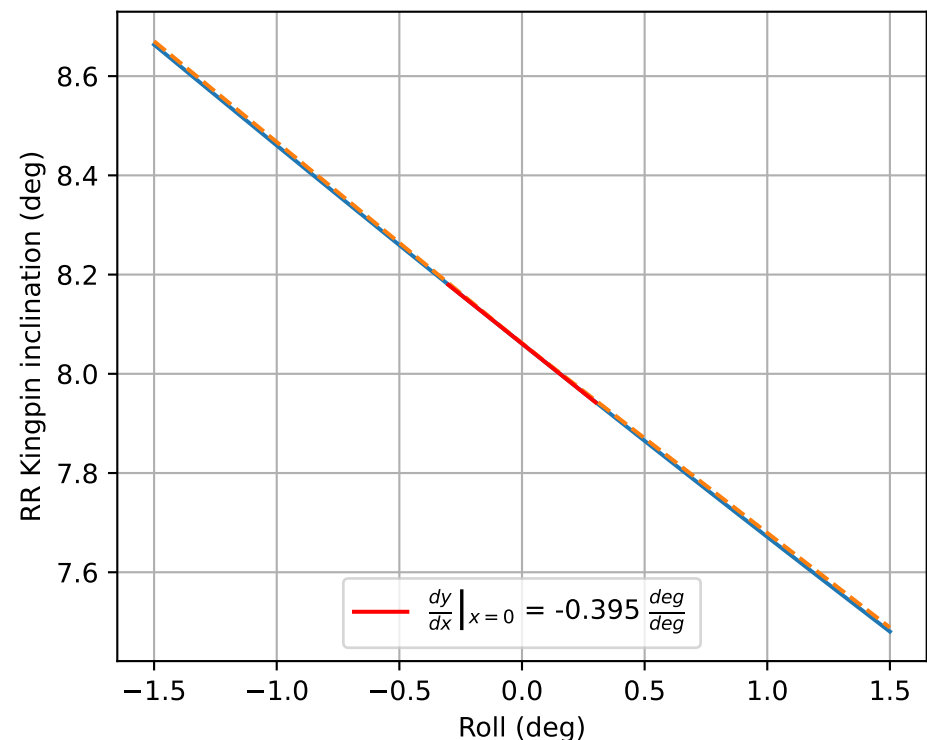
$$f(x) = a_1x + a_0$$

FL	$f(x) = 0.393x + 11.6$
FR	$f(x) = -0.393x + 11.6$
RL	$f(x) = 0.395x + 8.061$
RR	$f(x) = -0.395x + 8.061$

RL Roll KPI



RR Roll KPI



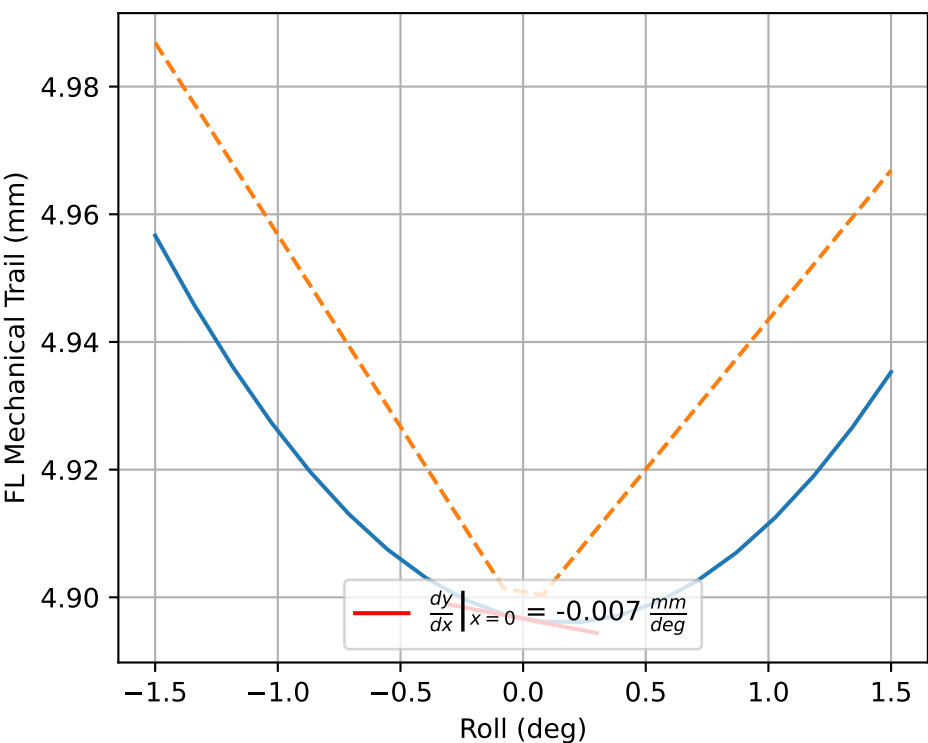
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

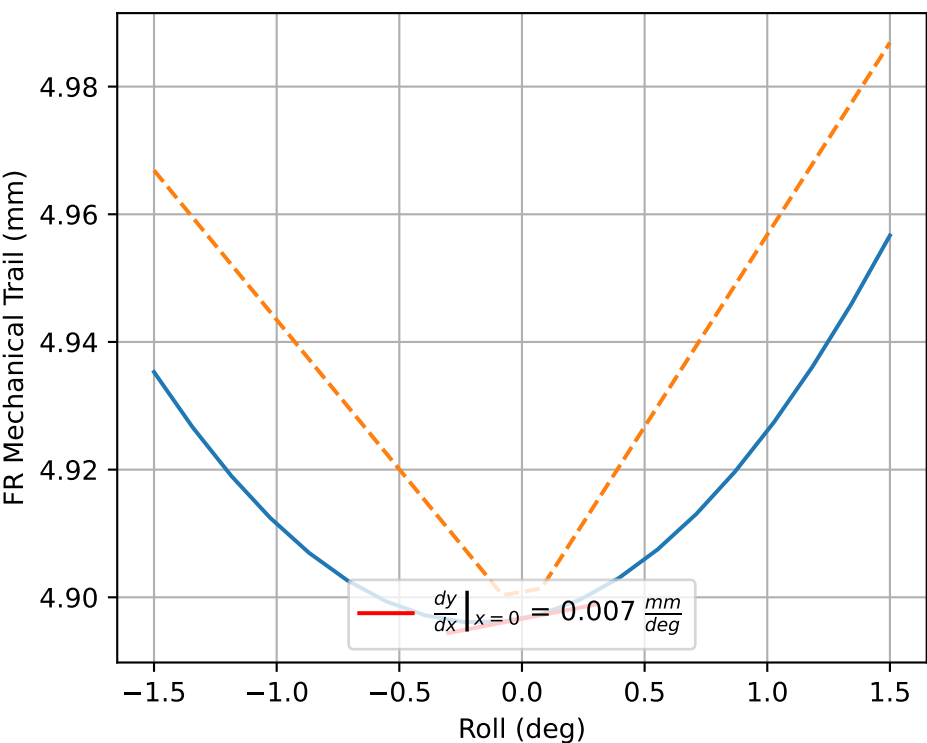
FL	$f(x) = 0.0x^3 + 0.004x^2 + 0.393x + 11.6$
FR	$f(x) = -0.0x^3 + 0.004x^2 + -0.393x + 11.6$
RL	$f(x) = -0.0x^3 + 0.005x^2 + 0.395x + 8.061$
RR	$f(x) = 0.0x^3 + 0.005x^2 + -0.395x + 8.061$



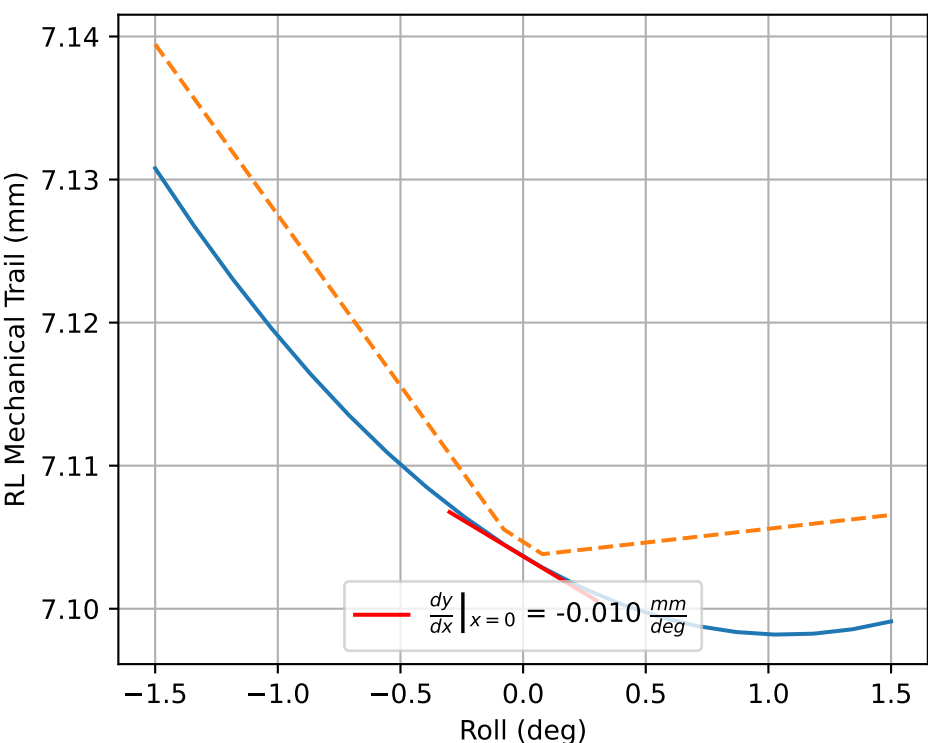
FL Roll Mechanical Trail



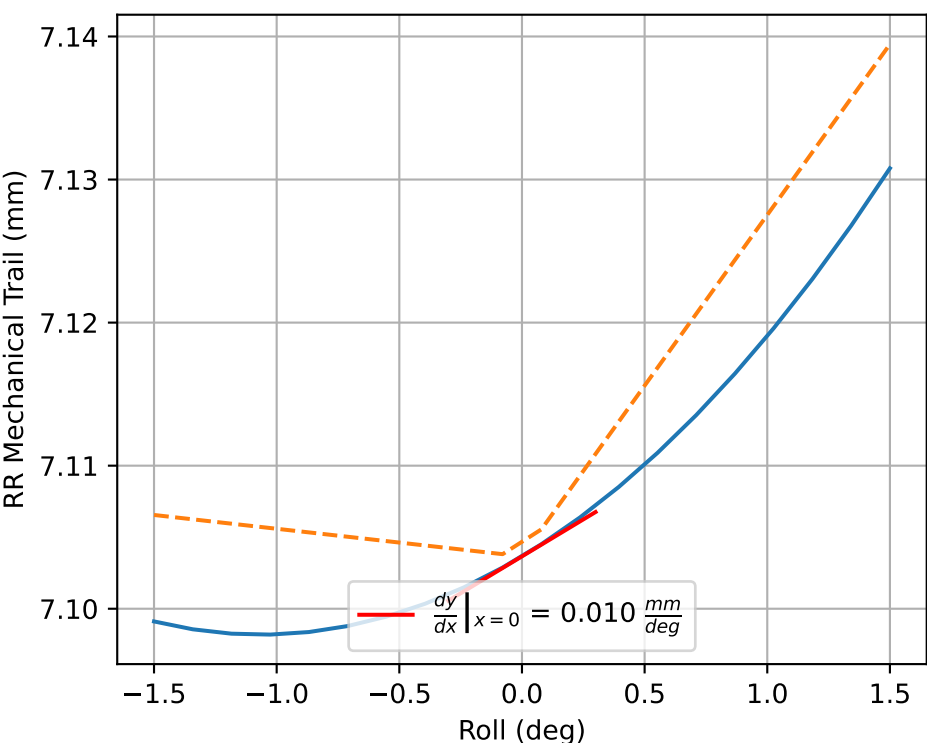
FR Roll Mechanical Trail



RL Roll Mechanical Trail



RR Roll Mechanical Trail



Linear Fit

$$f(x) = a_1x + a_0$$

FL	$f(x) = -0.007x + 4.897$
FR	$f(x) = 0.007x + 4.897$
RL	$f(x) = -0.01x + 7.104$
RR	$f(x) = 0.01x + 7.104$

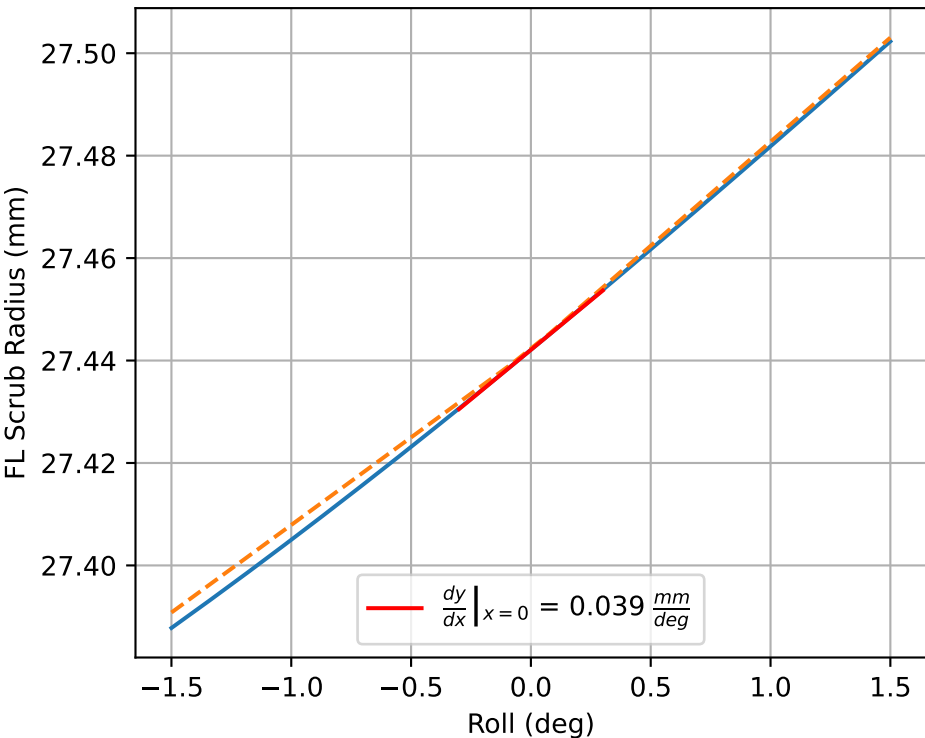
Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

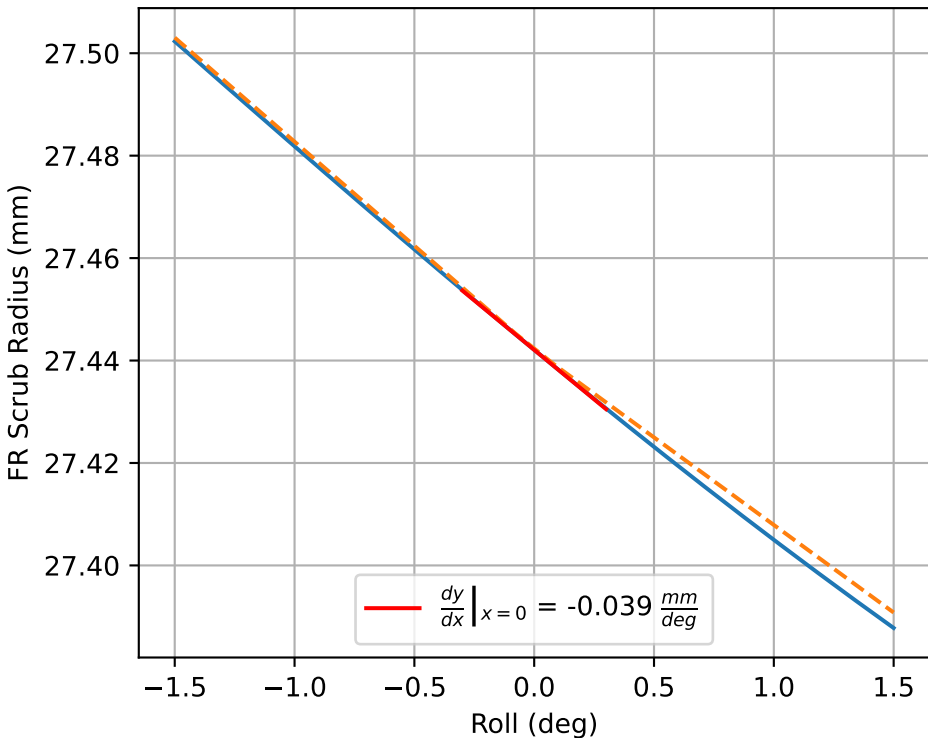
FL	$f(x) = 0.0x^3 + 0.022x^2 - 0.007x + 4.897$
FR	$f(x) = -0.0x^3 + 0.022x^2 + 0.007x + 4.897$
RL	$f(x) = -0.0x^3 + 0.005x^2 - 0.01x + 7.104$
RR	$f(x) = 0.0x^3 + 0.005x^2 + 0.01x + 7.104$



FL Roll Scrub Radius



FR Roll Scrub Radius

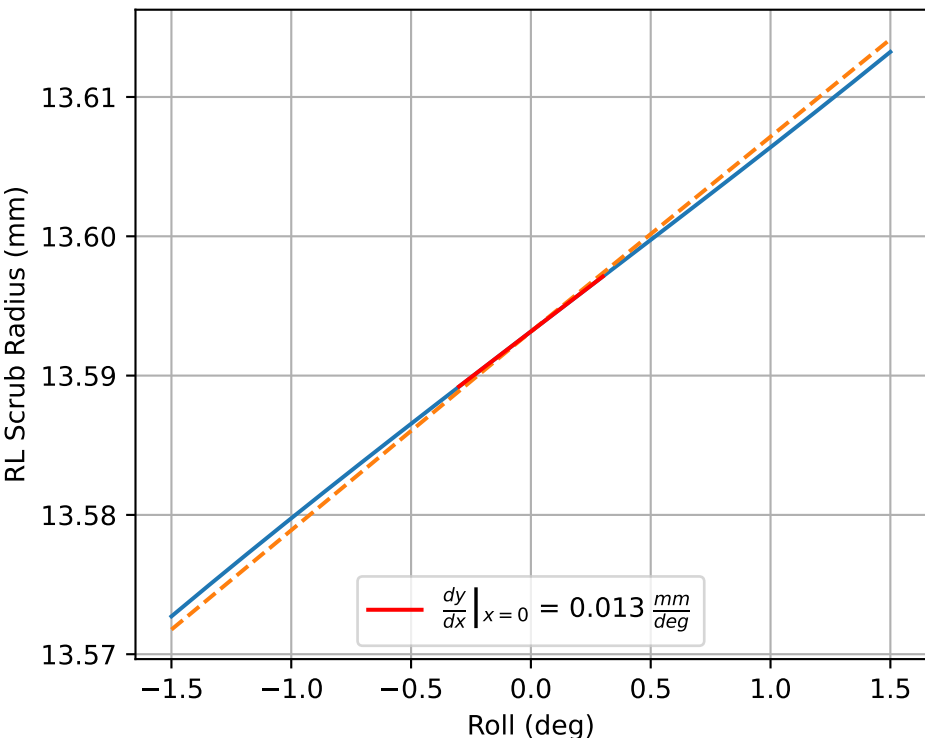


Linear Fit

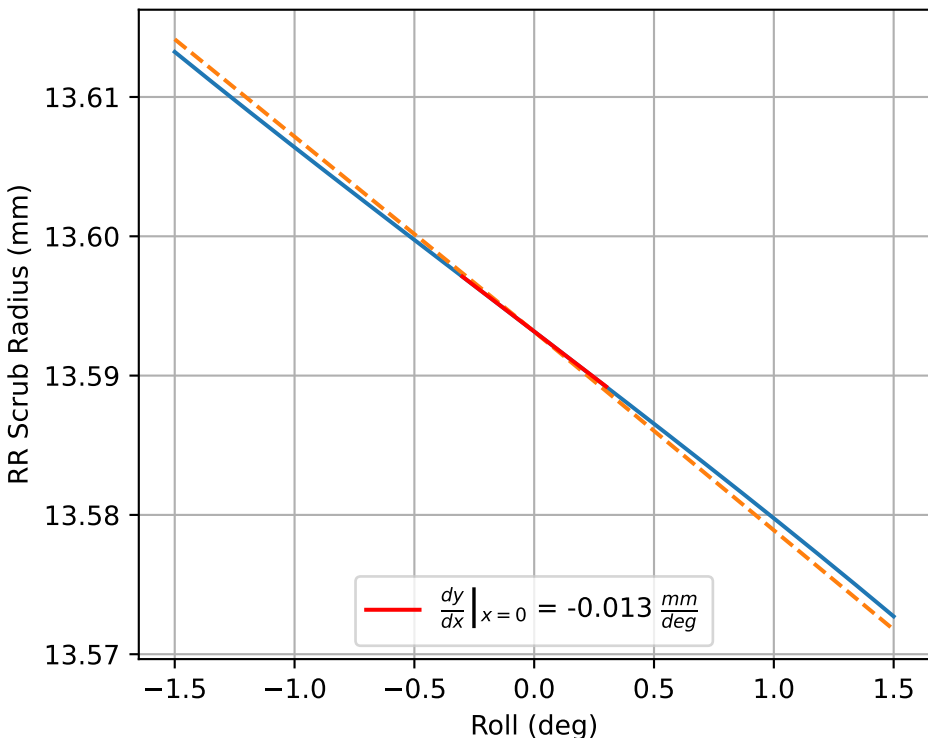
$$f(x) = a_1x + a_0$$

FL	$f(x) = 0.039x + 27.442$
FR	$f(x) = -0.039x + 27.442$
RL	$f(x) = 0.013x + 13.593$
RR	$f(x) = -0.013x + 13.593$

RL Roll Scrub Radius



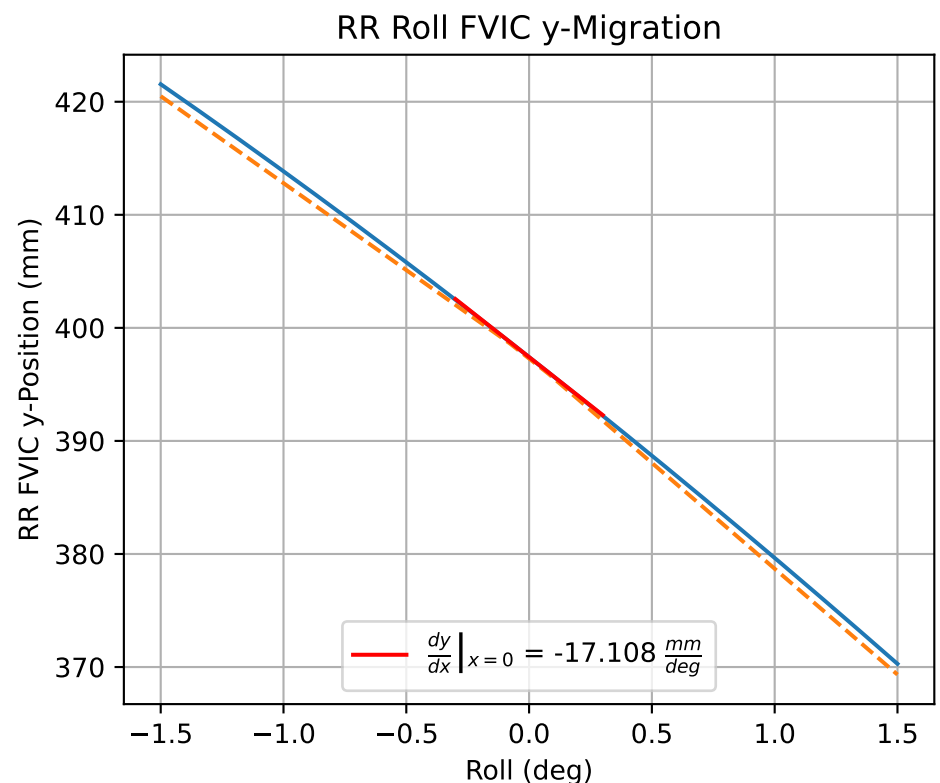
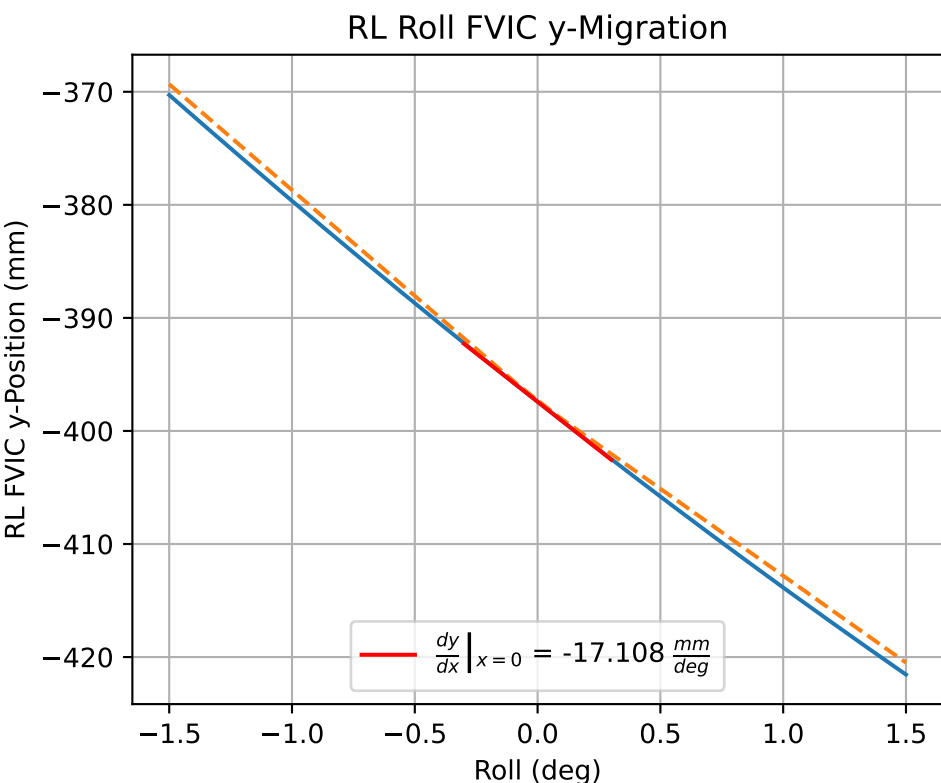
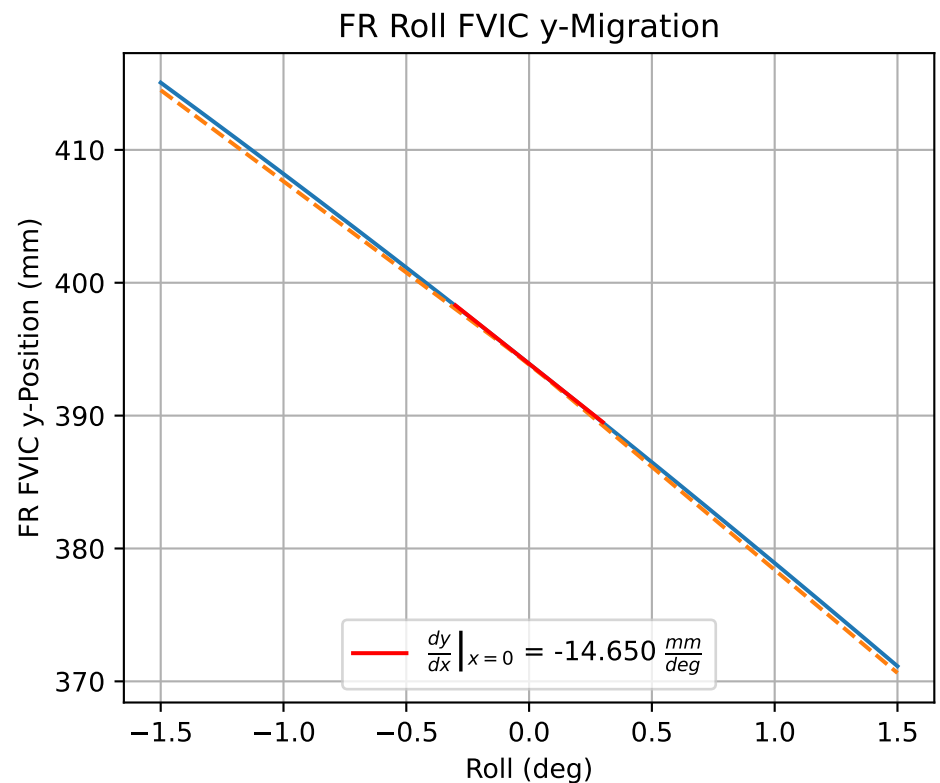
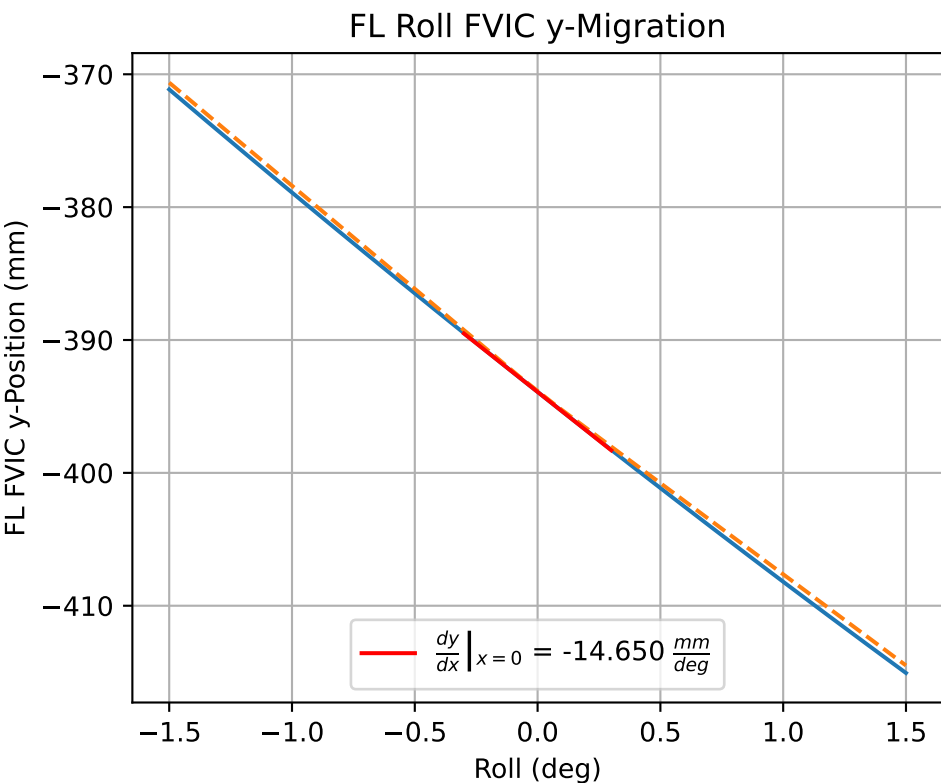
RR Roll Scrub Radius



Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = -0.0x^3 + 0.001x^2 + 0.039x + 27.442$
FR	$f(x) = 0.0x^3 + 0.001x^2 + -0.039x + 27.442$
RL	$f(x) = 0.0x^3 + -0.0x^2 + 0.013x + 13.593$
RR	$f(x) = -0.0x^3 + -0.0x^2 + -0.013x + 13.593$



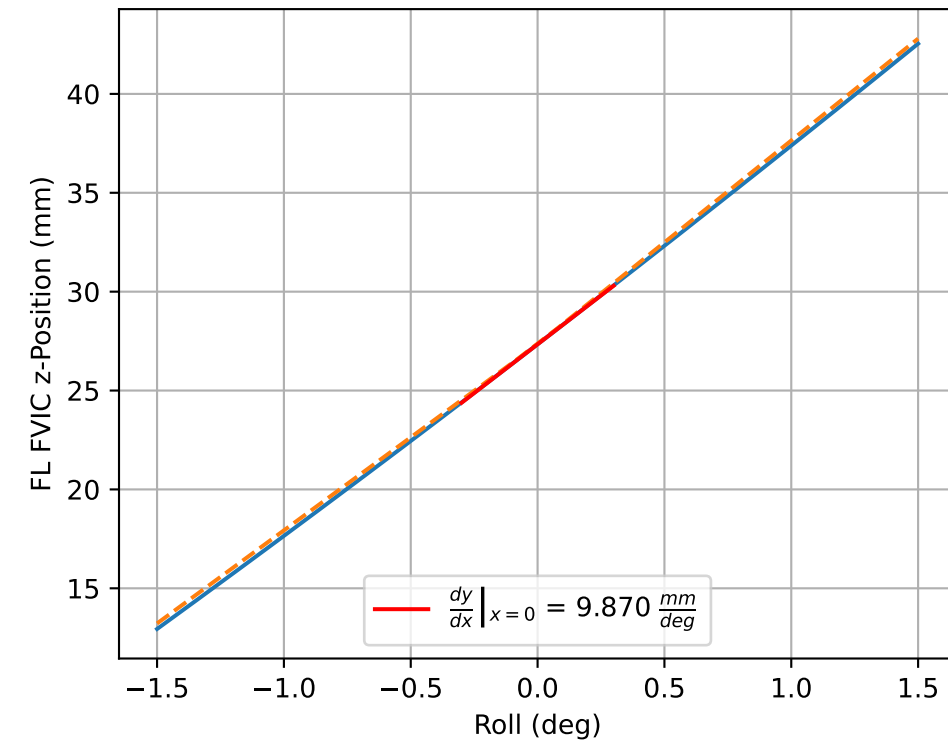
Full Model

FMU

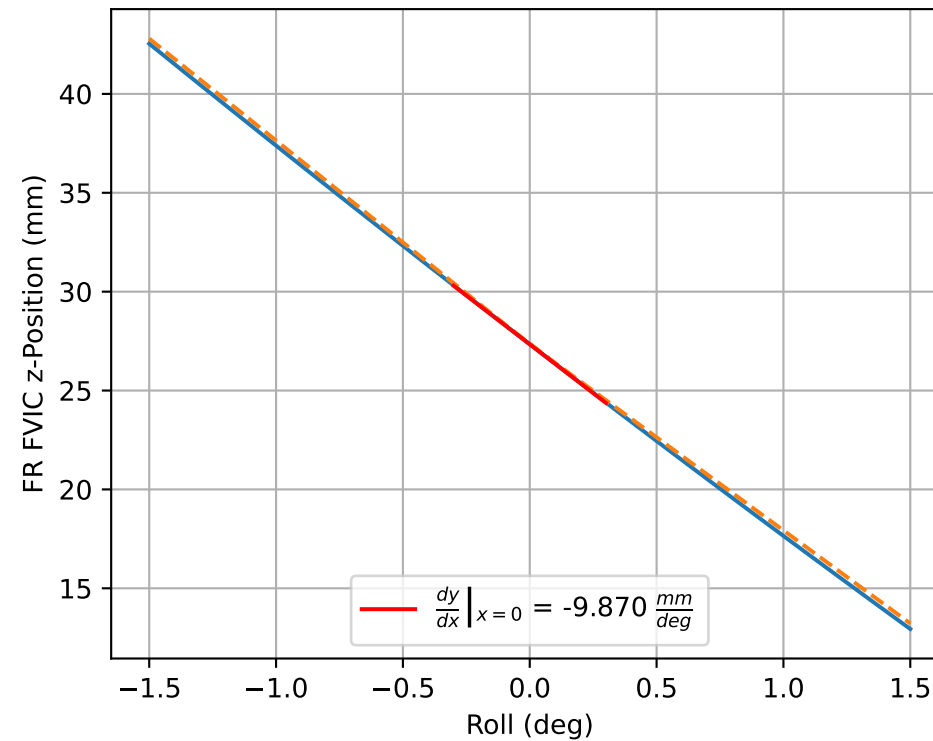
Linear Fit		$f(x) = a_1x + a_0$
FL	$f(x) = -14.65x + -393.907$	
FR	$f(x) = -14.65x + 393.907$	
RL	$f(x) = -17.108x + -397.417$	
RR	$f(x) = -17.108x + 397.417$	

Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL	$f(x) = 0.005x^3 + 0.358x^2 + -14.65x + -393.907$	
FR	$f(x) = 0.005x^3 + -0.358x^2 + -14.65x + 393.907$	
RL	$f(x) = 0.009x^3 + 0.667x^2 + -17.108x + -397.417$	
RR	$f(x) = 0.009x^3 + -0.667x^2 + -17.108x + 397.417$	

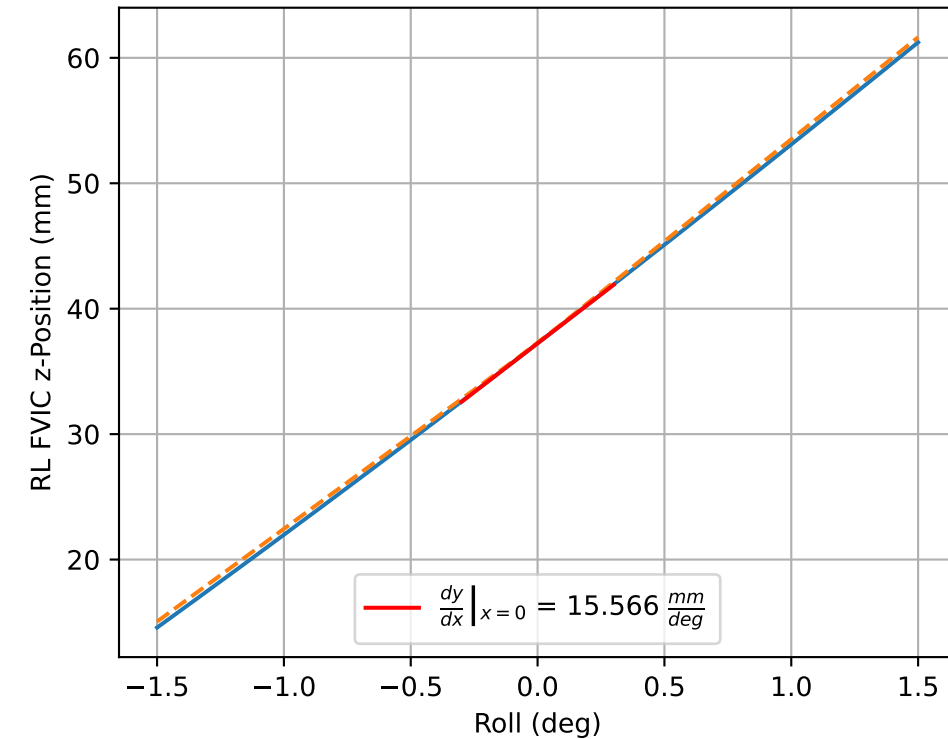
FL Roll FVIC z-Migration



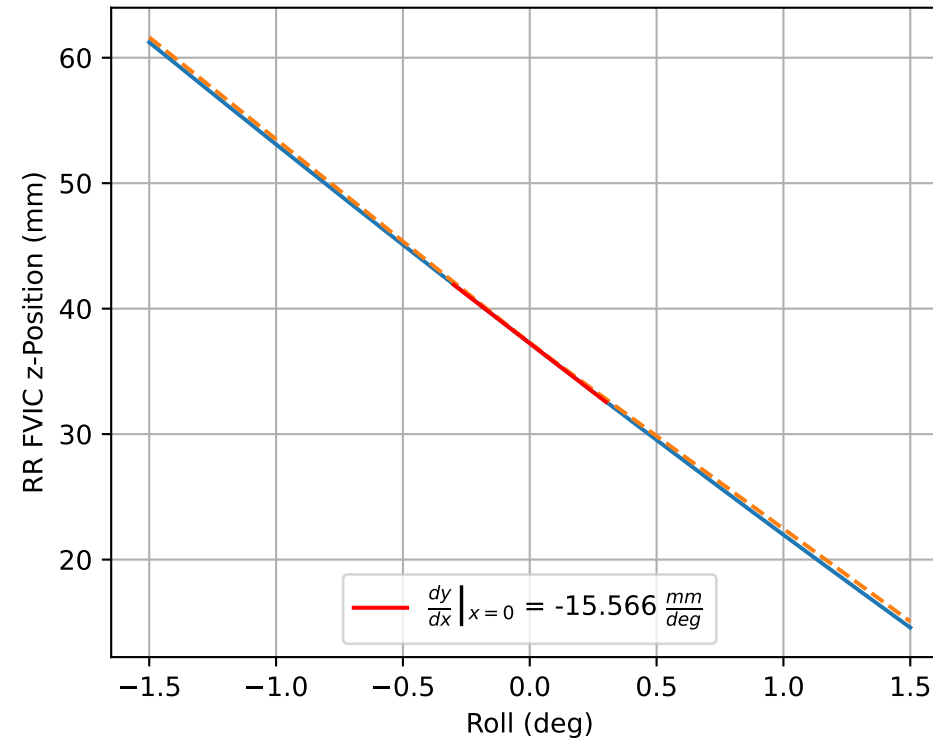
FR Roll FVIC z-Migration



RL Roll FVIC z-Migration



RR Roll FVIC z-Migration



Linear Fit

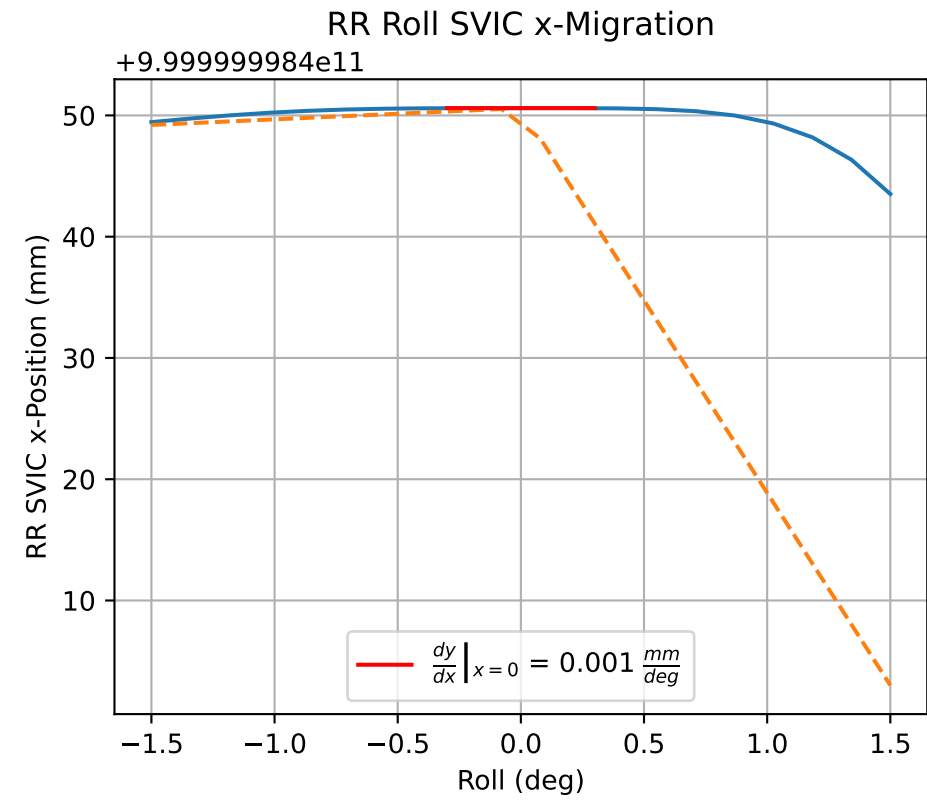
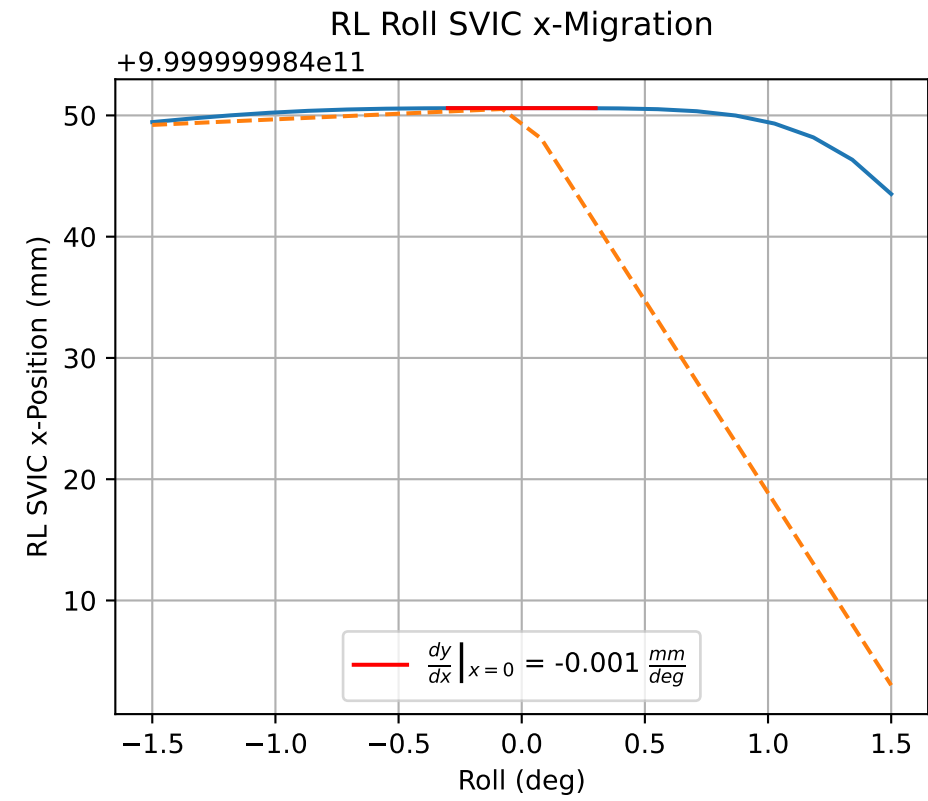
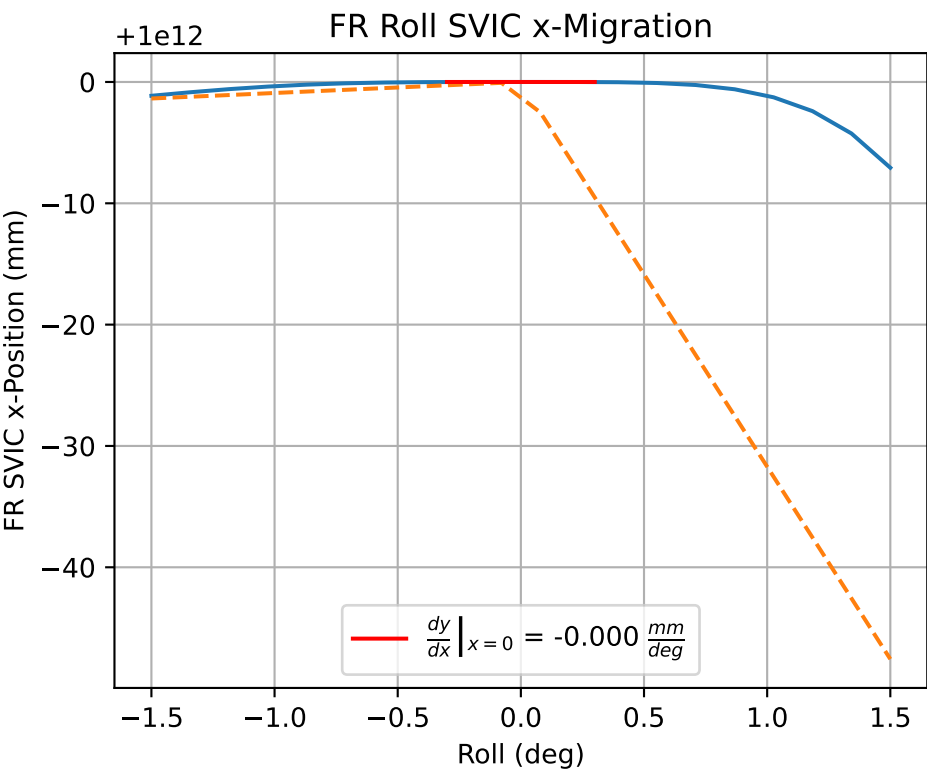
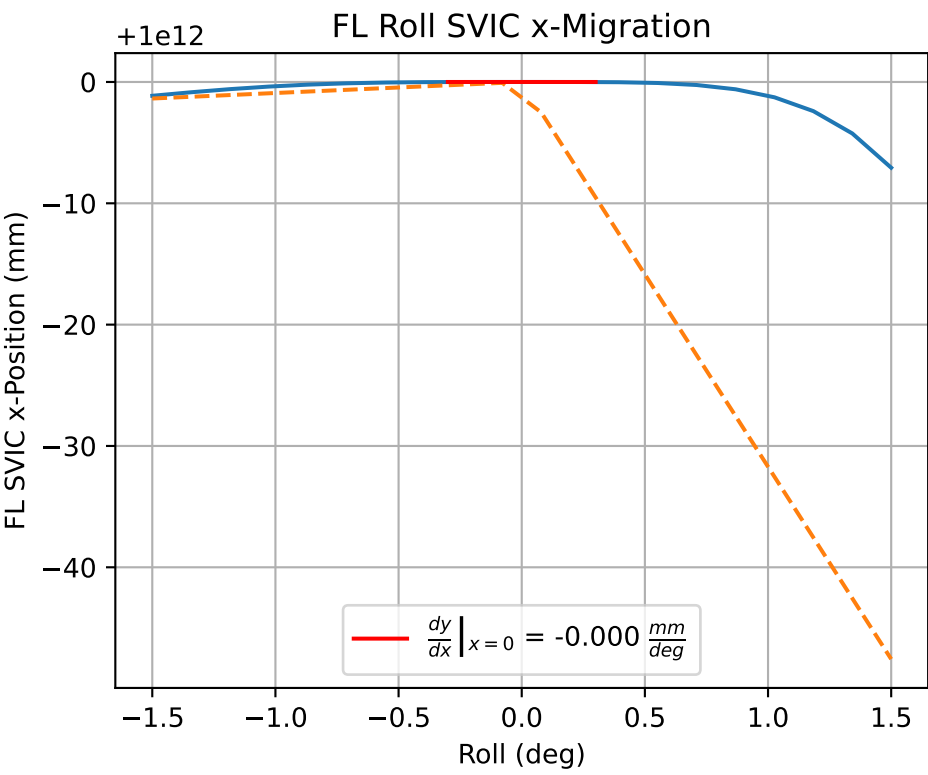
$$f(x) = a_1x + a_0$$

FL	$f(x) = 9.87x + 27.34$
FR	$f(x) = -9.87x + 27.34$
RL	$f(x) = 15.566x + 37.239$
RR	$f(x) = -15.566x + 37.239$

Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

FL	$f(x) = -0.002x^3 + 0.178x^2 + 9.87x + 27.34$
FR	$f(x) = 0.002x^3 + 0.178x^2 - 9.87x + 27.34$
RL	$f(x) = -0.006x^3 + 0.296x^2 + 15.566x + 37.239$
RR	$f(x) = 0.007x^3 + 0.296x^2 - 15.566x + 37.239$

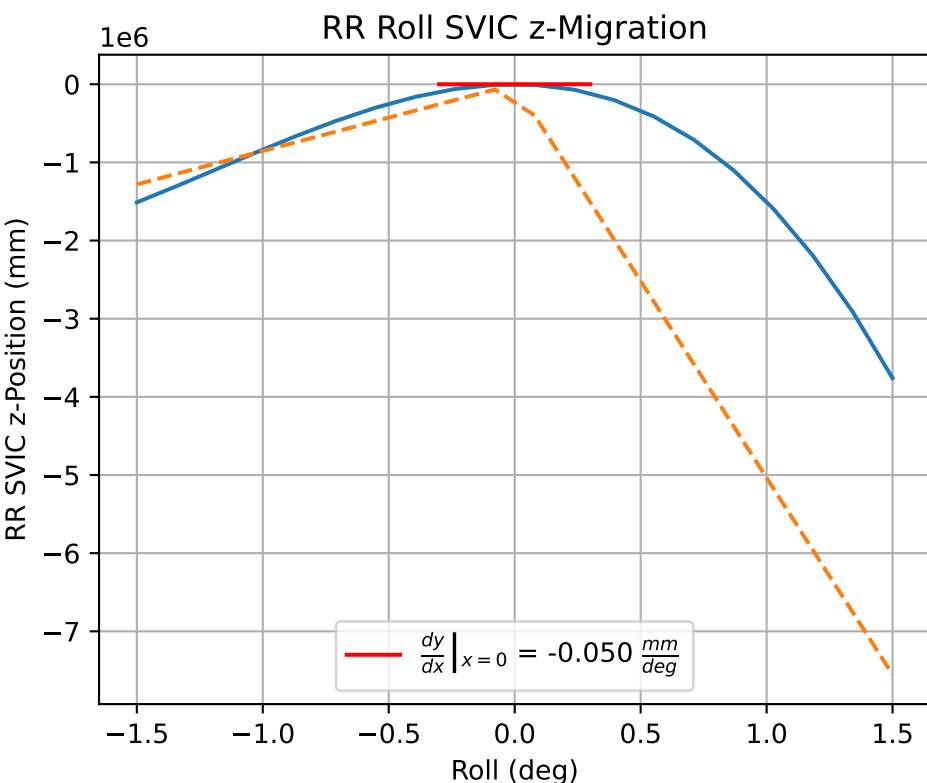
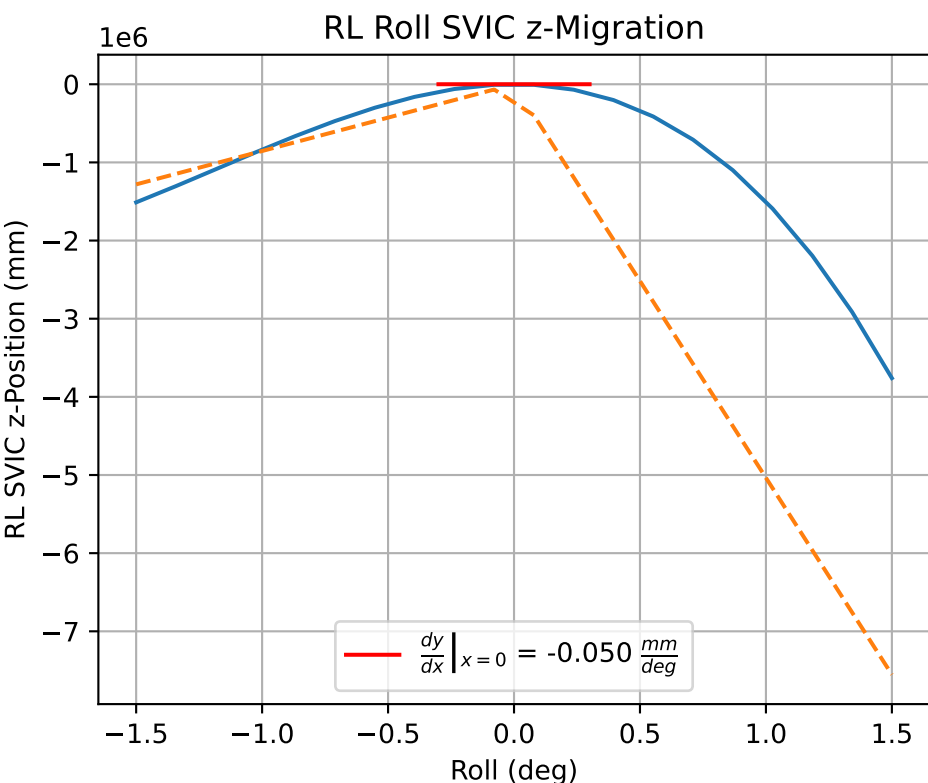
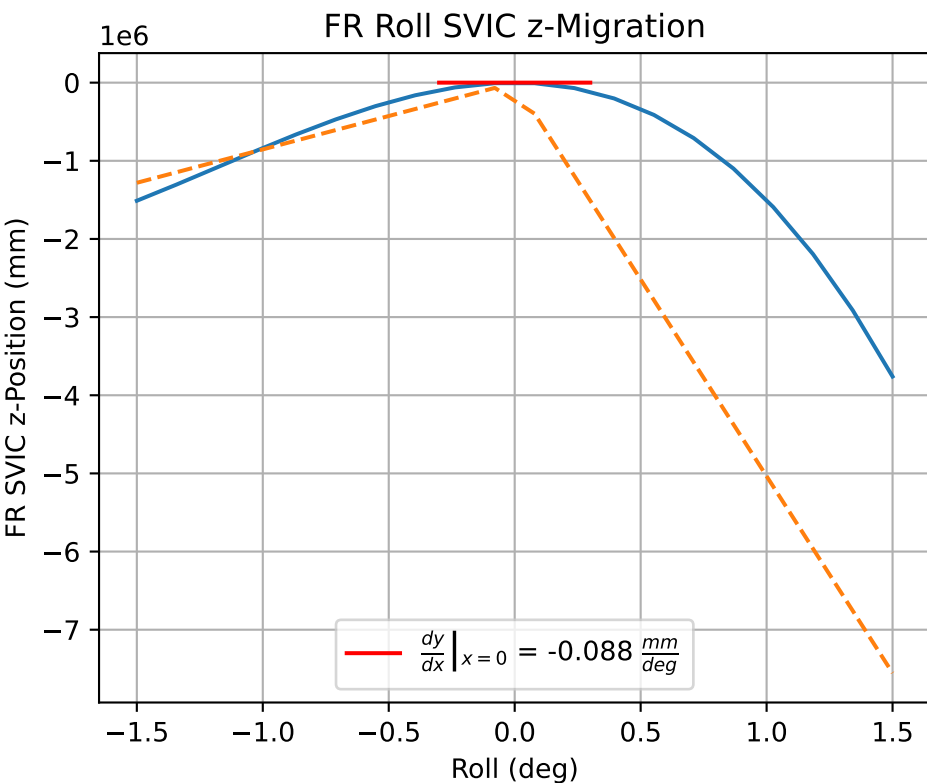
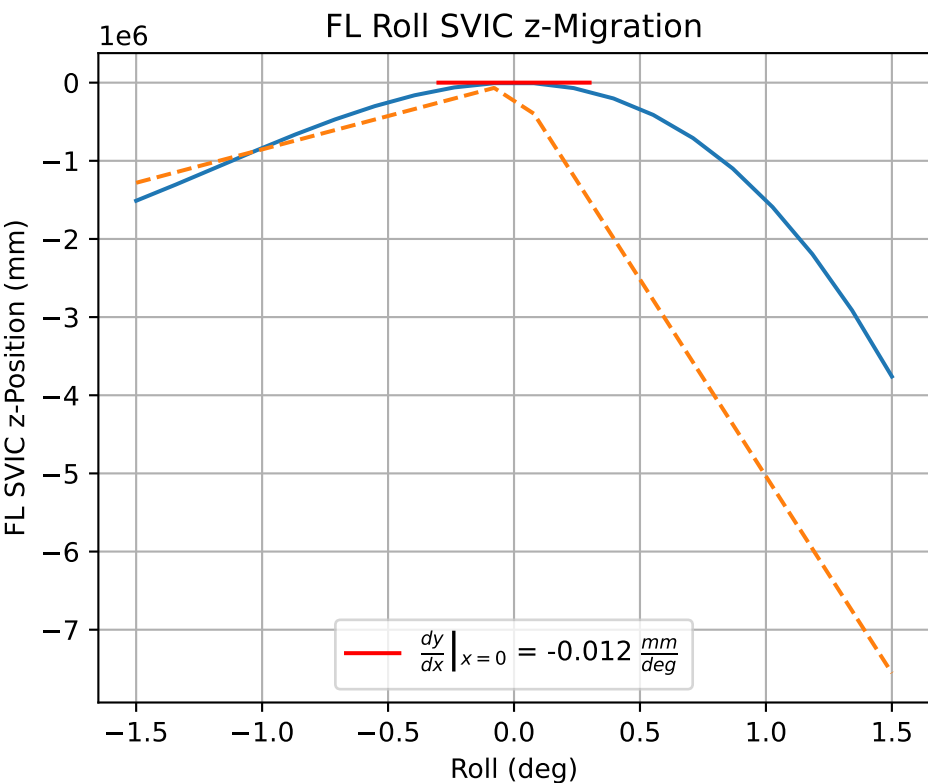


Full Model

FMU

Linear Fit		$f(x) = a_1x + a_0$
FL	$f(x) = -0.0x + 1.000e+12$	
FR	$f(x) = -0.0x + 1.000e+12$	
RL	$f(x) = -0.001x + 1.000e+12$	
RR	$f(x) = 0.001x + 1.000e+12$	

Cubic Fit		$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$
FL	$f(x) = -1.062x^3 + -1.689x^2 + 0.555x + 1.0e+12$	
FR	$f(x) = -1.062x^3 + -1.689x^2 + 0.555x + 1.0e+12$	
RL	$f(x) = -1.062x^3 + -1.695x^2 + 0.555x + 1.0e+12$	
RR	$f(x) = -1.062x^3 + -1.695x^2 + 0.556x + 1.0e+12$	



Linear Fit

$f(x) = a_1x + a_0$

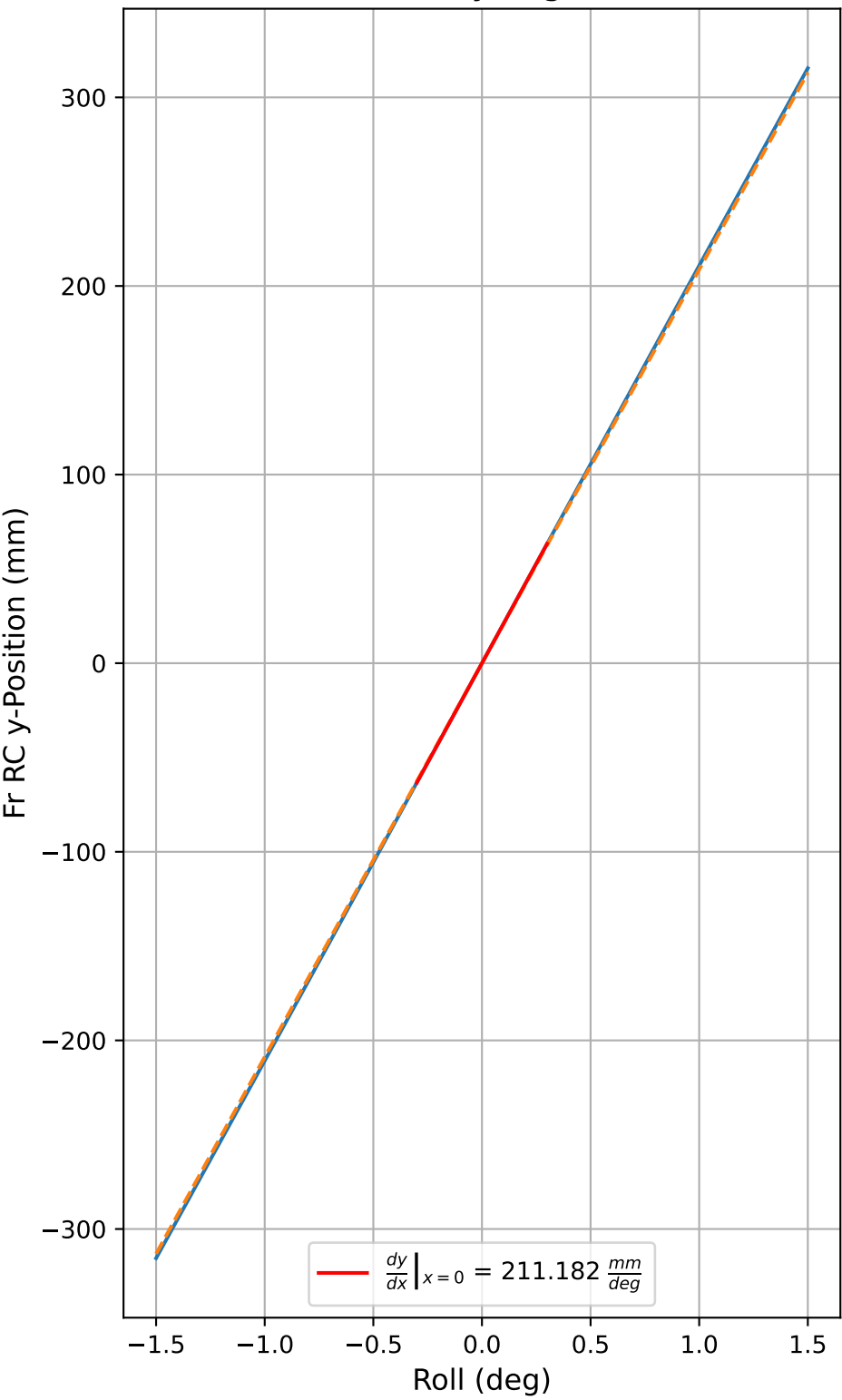
FL	$f(x) = -0.012x + 203.231$
FR	$f(x) = -0.088x + 203.231$
RL	$f(x) = -0.05x + 203.262$
RR	$f(x) = -0.05x + 203.262$

Cubic Fit

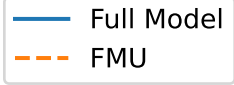
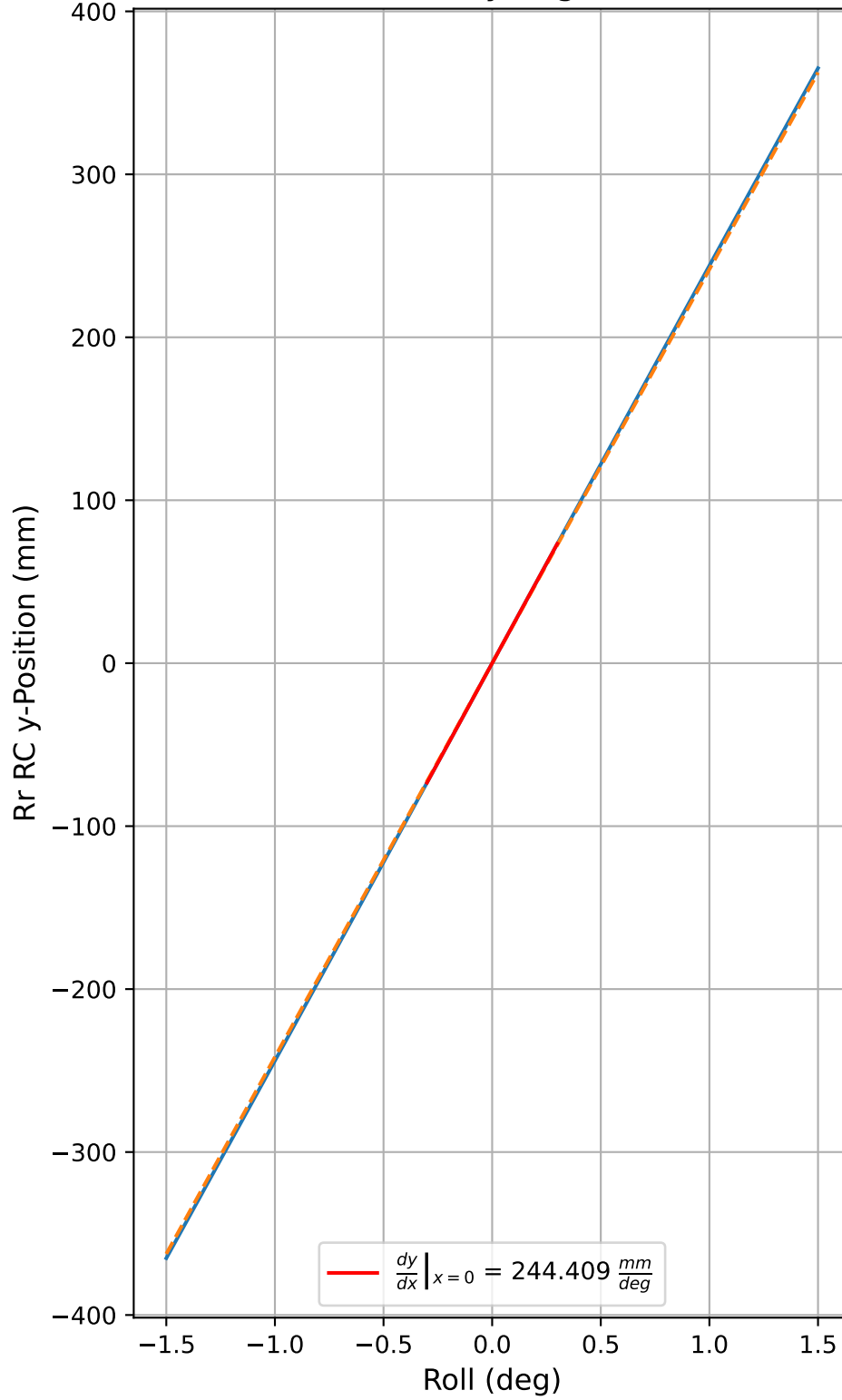
$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$

FL	$f(x) = -333350.204x^3 + -1171318.784x^2 + 473.537x + 1.000$
FR	$f(x) = -333350.204x^3 + -1171318.784x^2 + 473.462x + 1.000$
RL	$f(x) = -333350.204x^3 + -1171318.784x^2 + 473.499x + 1.000$
RR	$f(x) = -333350.203x^3 + -1171318.784x^2 + 473.499x + 1.000$

Fr Roll RC y-Migration



Rr Roll RC y-Migration



Linear Fit

$f(x) = a_1x + a_0$

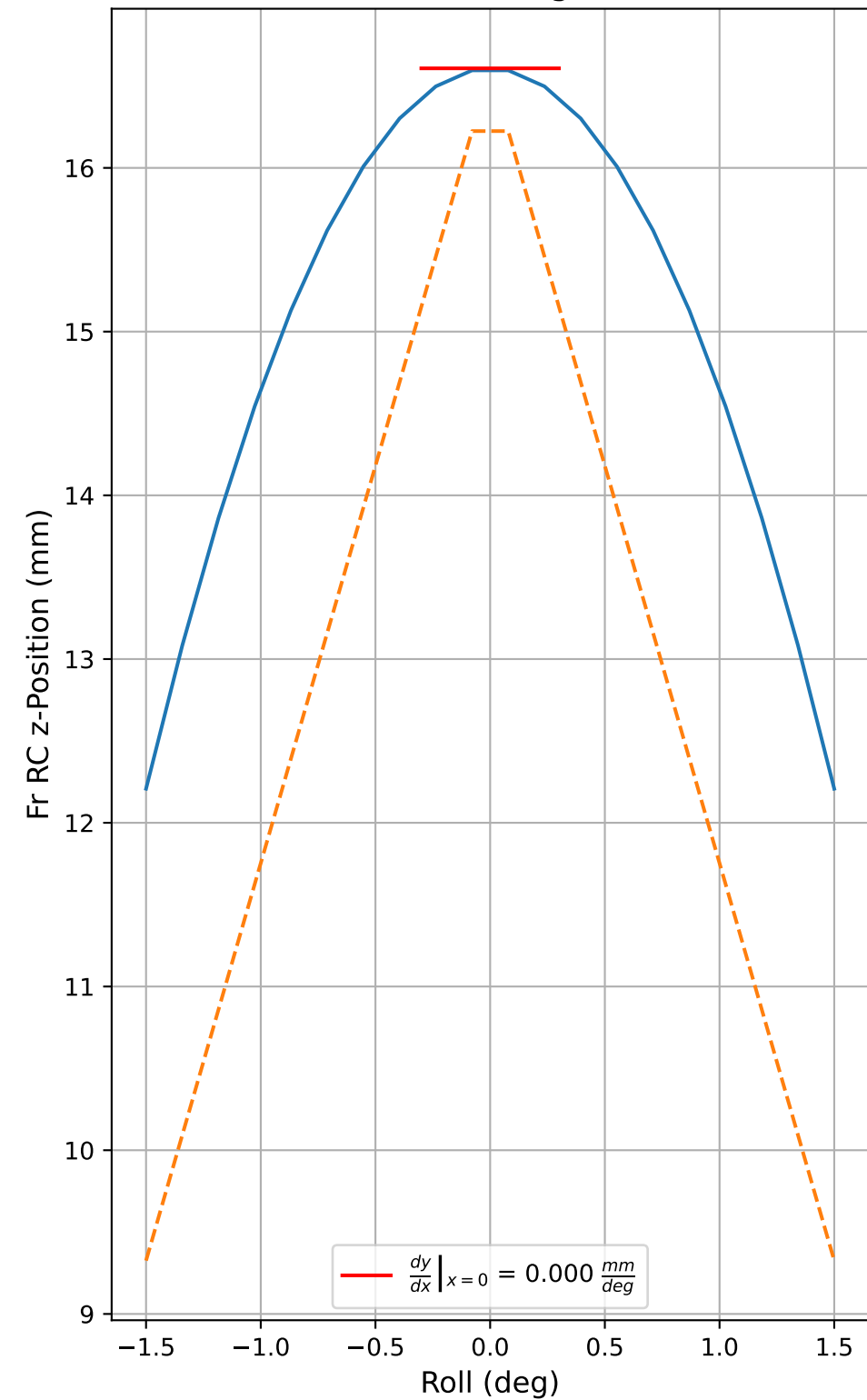
Fr	$f(x) = 211.182x + -0.0$
Rr	$f(x) = 244.409x + 0.0$

Cubic Fit

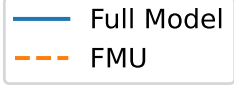
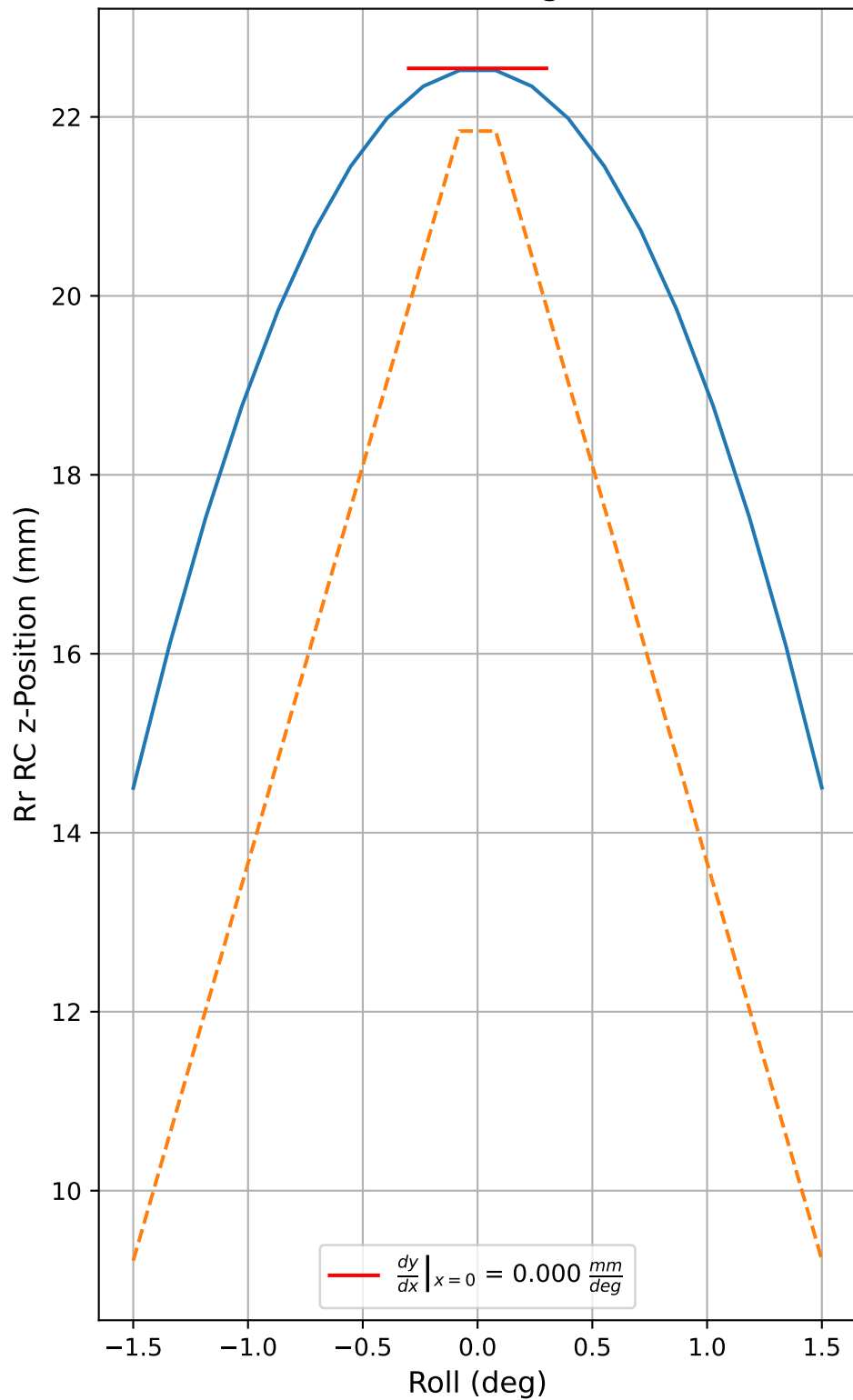
$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$

Fr	$f(x) = -0.387x^3 + -0.0x^2 + 211.182x + 0.0$
Rr	$f(x) = -0.442x^3 + -0.0x^2 + 244.409x + 0.0$

Fr Roll RC z-Migration



Rr Roll RC z-Migration

**Linear Fit**

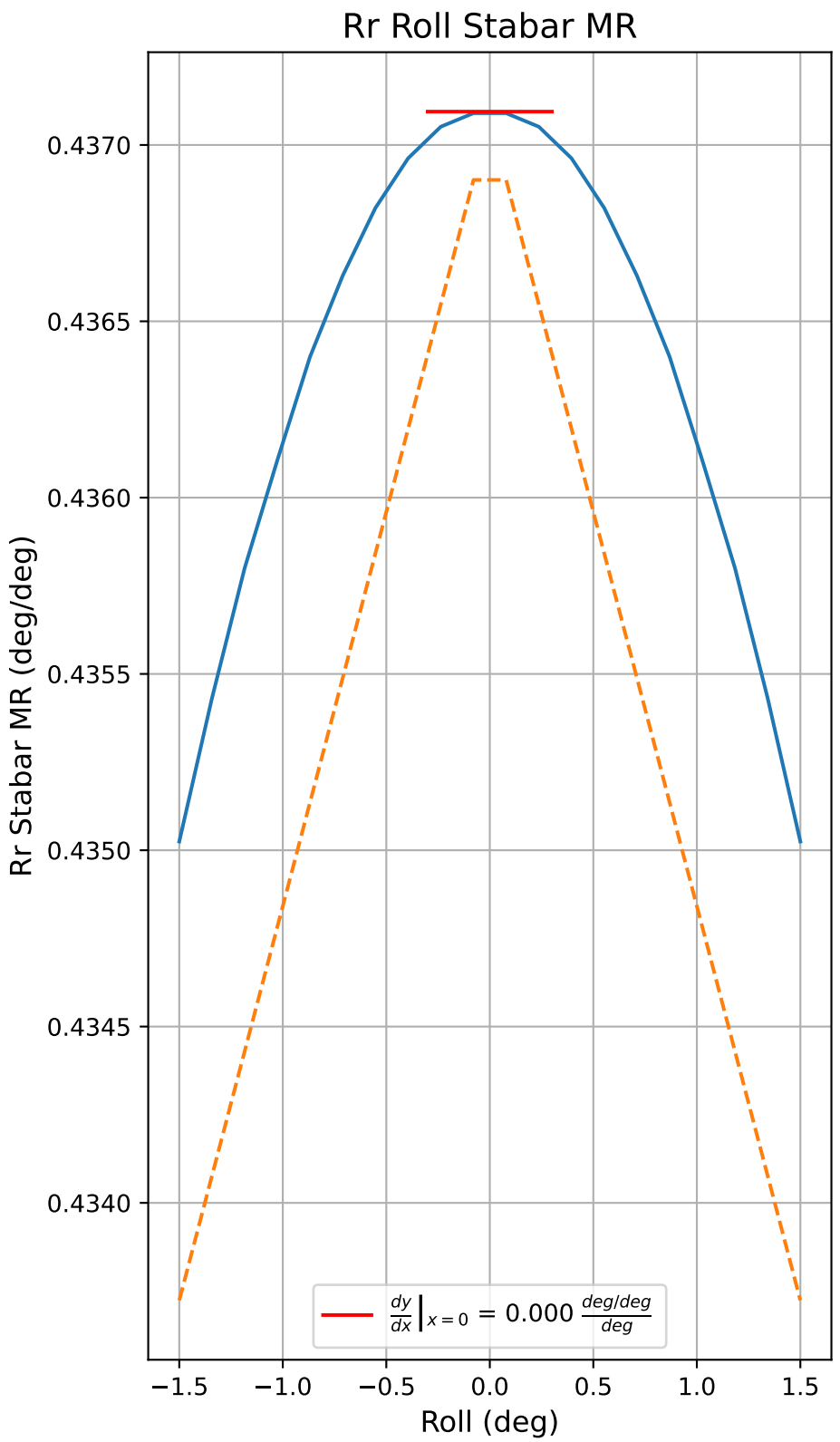
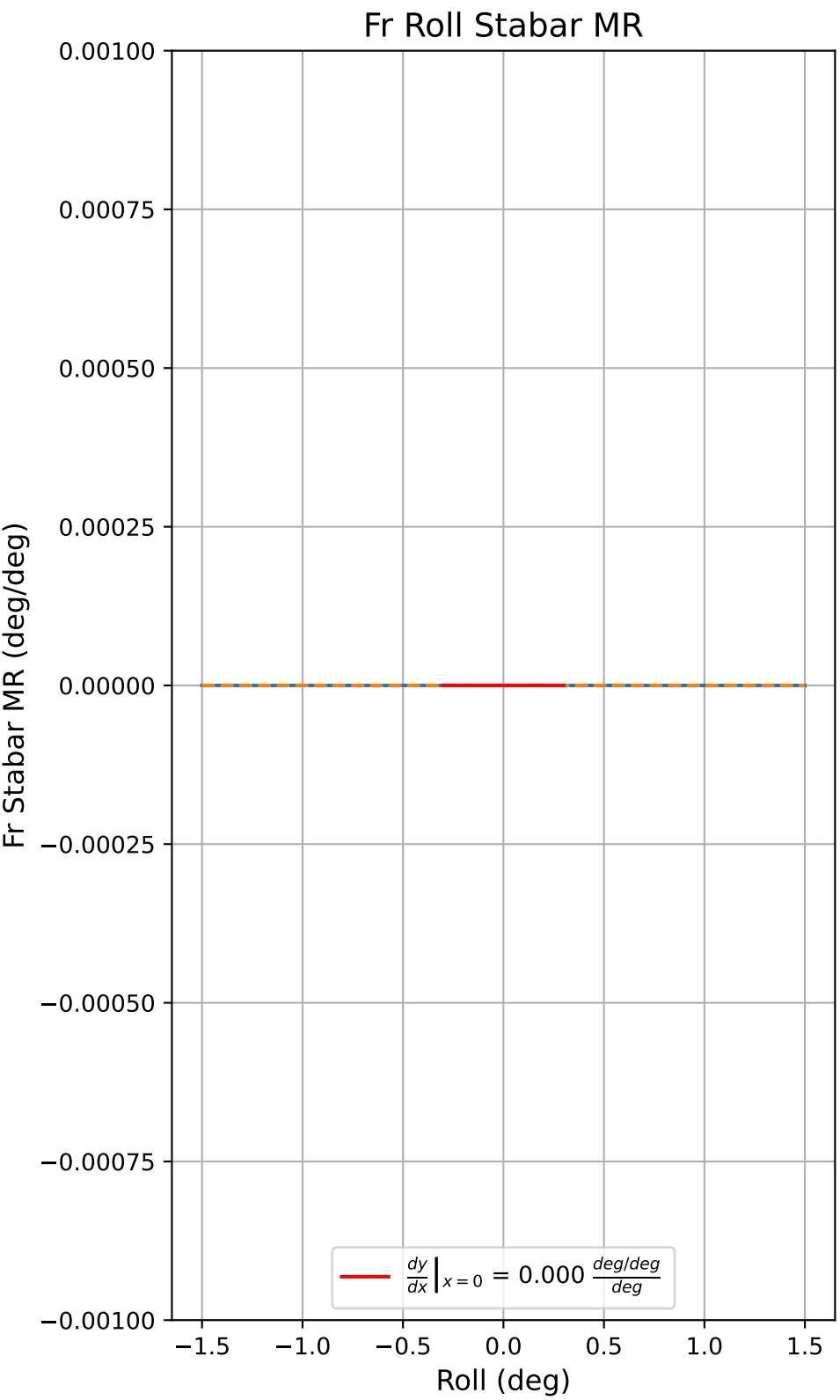
$$f(x) = a_1x + a_0$$

Fr	$f(x) = 0.0x + 16.608$
Rr	$f(x) = 0.0x + 22.543$

Cubic Fit

$$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$$

Fr	$f(x) = 0.0x^3 + -1.956x^2 + -0.0x + 16.606$
Rr	$f(x) = 0.001x^3 + -3.575x^2 + -0.0x + 22.54$



Full Model

FMU

Linear Fit

$f(x) = a_1x + a_0$

Fr	$f(x) = 0.0x + 0.0$
Rr	$f(x) = 0.0x + 0.437$

Cubic Fit

$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$

Fr	$f(x) = 0.0x^3 + 0.0x^2 + 0.0x + 0.0$
Rr	$f(x) = 0.0x^3 + -0.001x^2 + -0.0x + 0.437$