

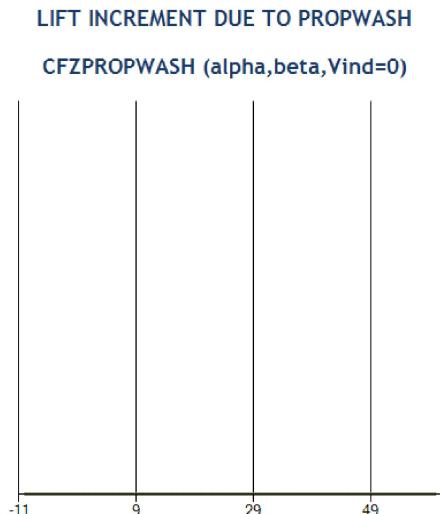
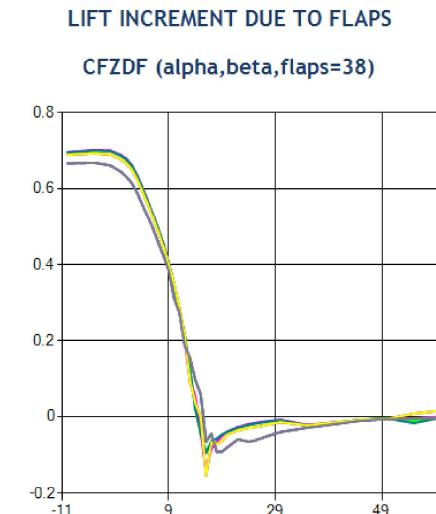
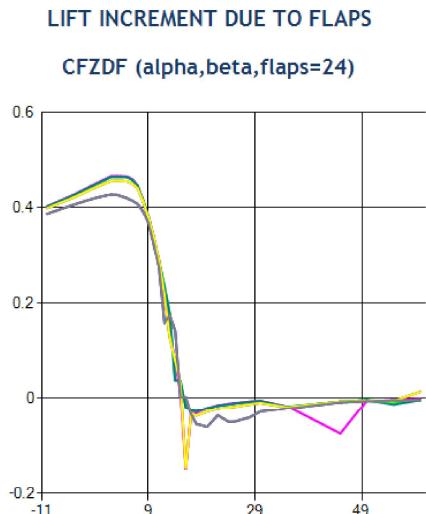
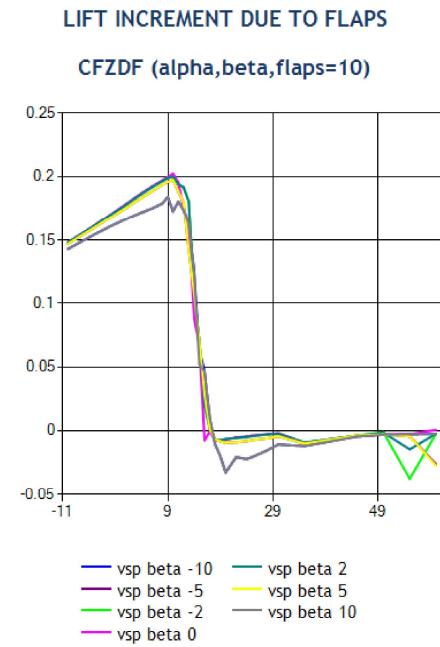
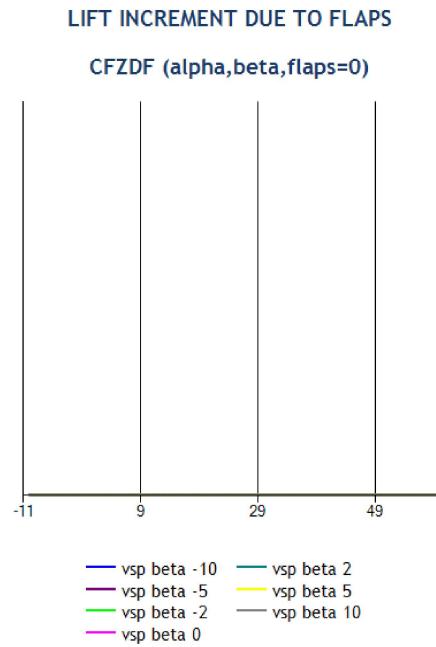
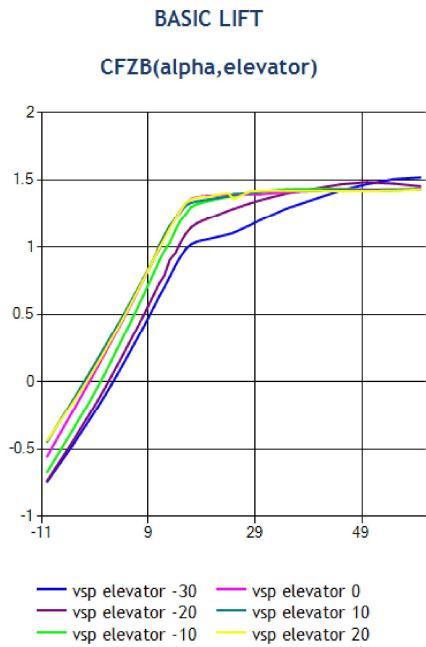
Beagle Pup Aerodynamic data built from vspaero; CG (5, 0, -0.5)FT, 2016-10-24 01:58

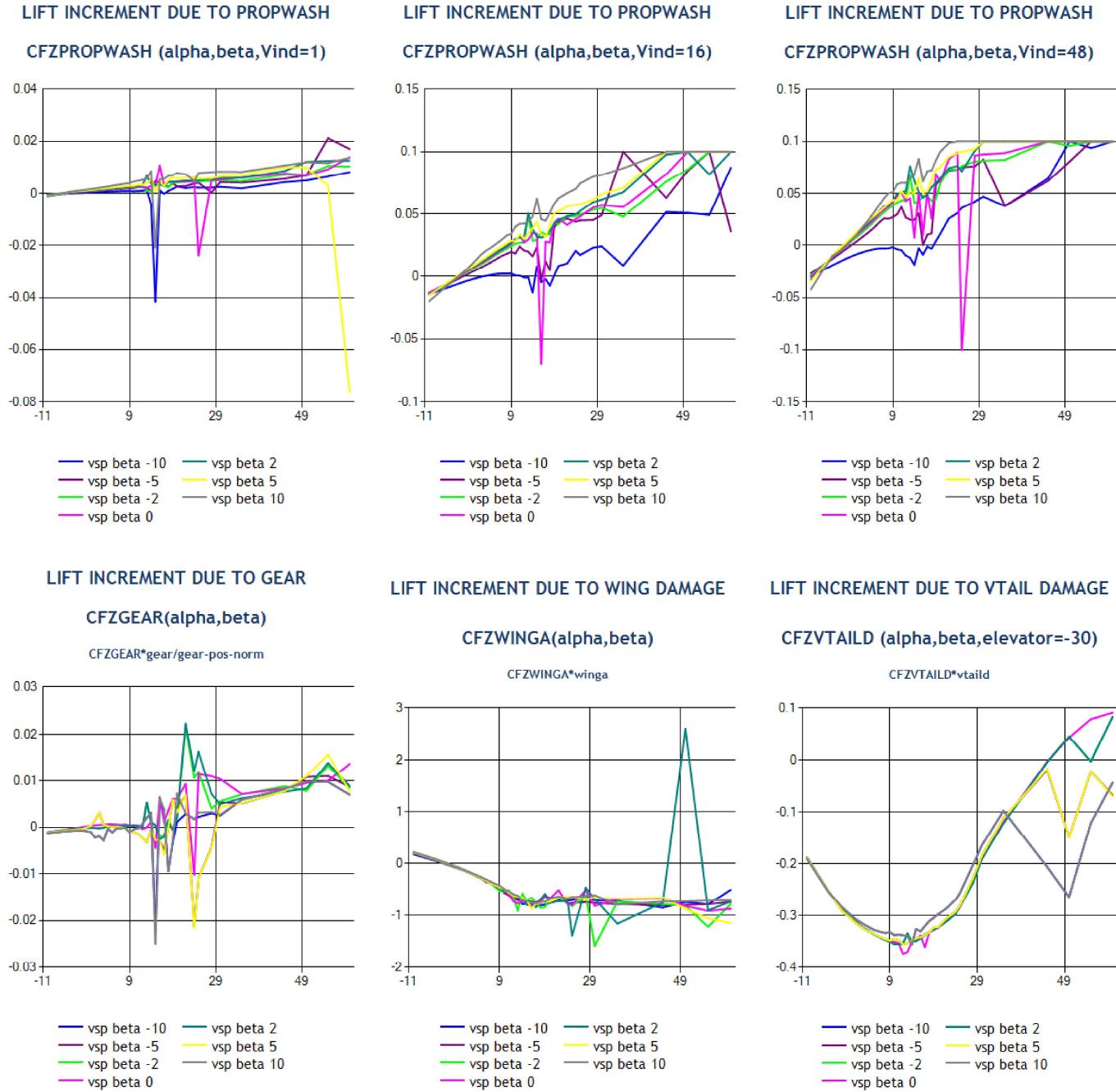
Richard Harrison, rjh@zaretto.com, ZDAT/AED/2016/10-08

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Full,Propeller,Gear,Flaps

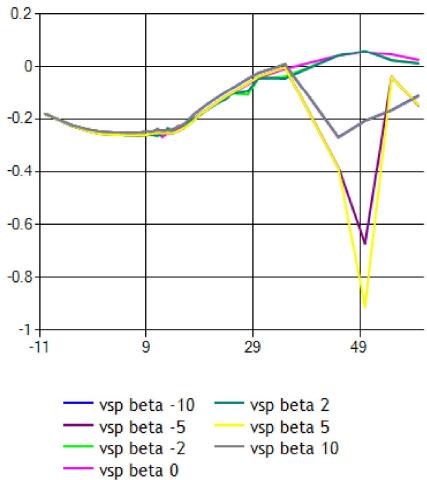
LIFT



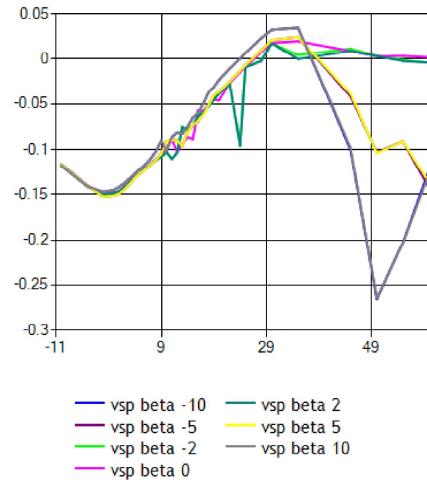


LIFT INCREMENT DUE TO VTAIL DAMAGE**CFZVTAILD (alpha,beta,elevator=-20)**

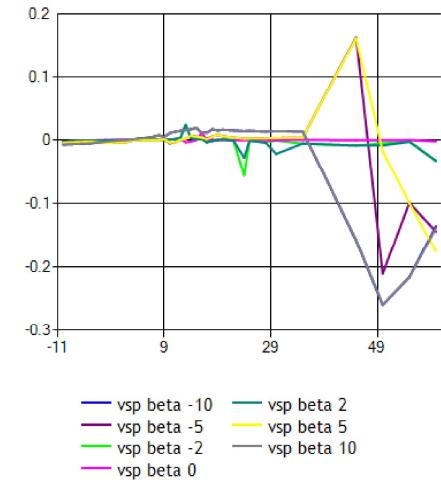
CFZVTAILD*vtaild

**LIFT INCREMENT DUE TO VTAIL DAMAGE****CFZVTAILD (alpha,beta,elevator=-10)**

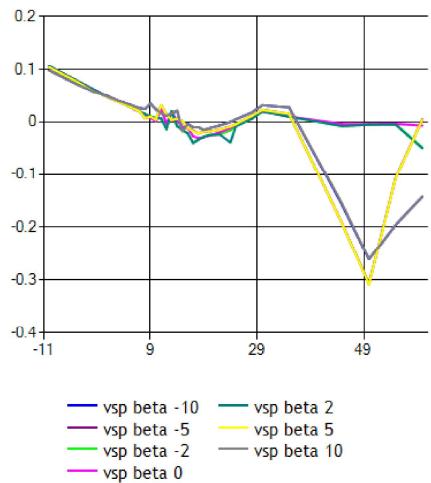
CFZVTAILD*vtaild

**LIFT INCREMENT DUE TO VTAIL DAMAGE****CFZVTAILD (alpha,beta,elevator=0)**

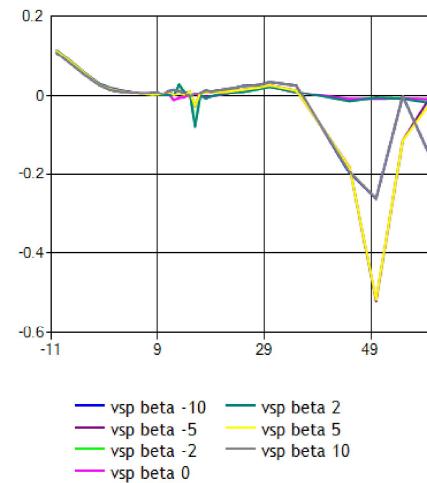
CFZVTAILD*vtaild

**LIFT INCREMENT DUE TO VTAIL DAMAGE****CFZVTAILD (alpha,beta,elevator=10)**

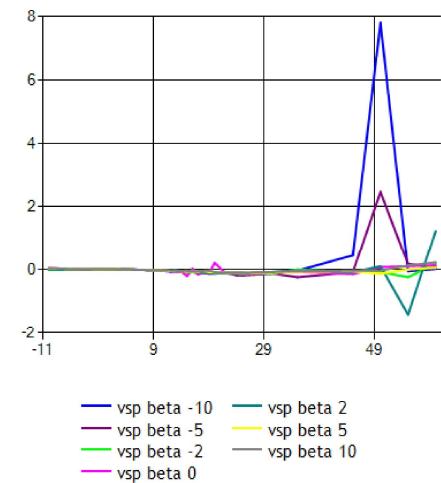
CFZVTAILD*vtaild

**LIFT INCREMENT DUE TO VTAIL DAMAGE****CFZVTAILD (alpha,beta,elevator=20)**

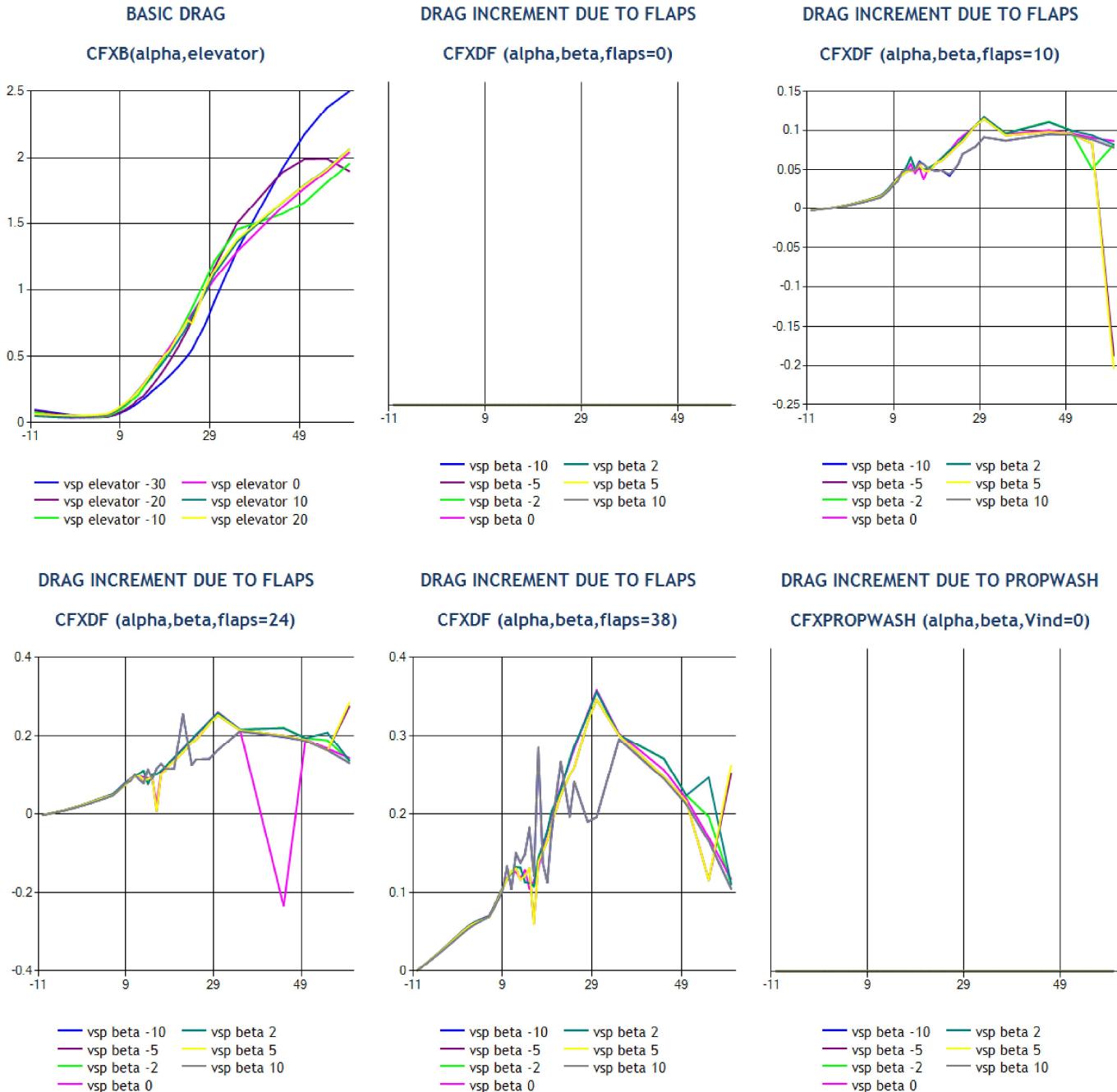
CFZVTAILD*vtaild

**LIFT INCREMENT DUE TO HTAIL DAMAGE****CFZHHTAILA(alpha,beta)**

CFZHHTAILA*htaila

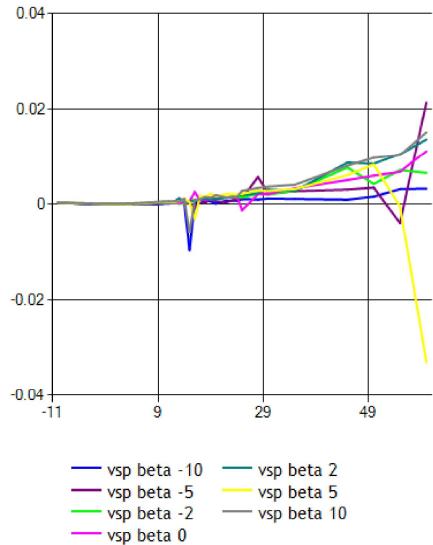


DRAG



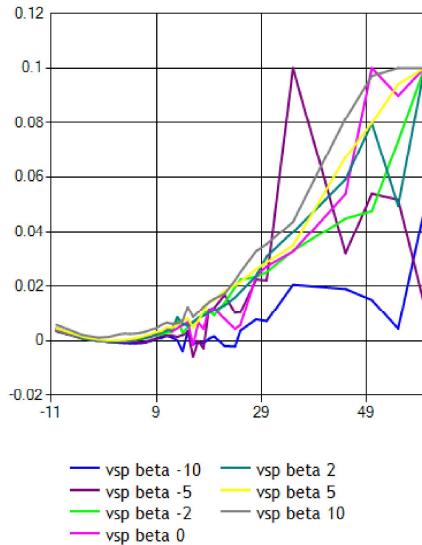
DRAG INCREMENT DUE TO PROWPASH

CFXPROWPASH (alpha,beta,Vind=1)



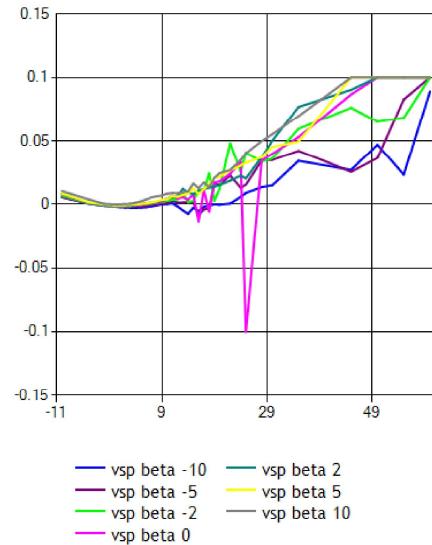
DRAG INCREMENT DUE TO PROWPASH

CFXPROWPASH (alpha,beta,Vind=16)



DRAG INCREMENT DUE TO PROWPASH

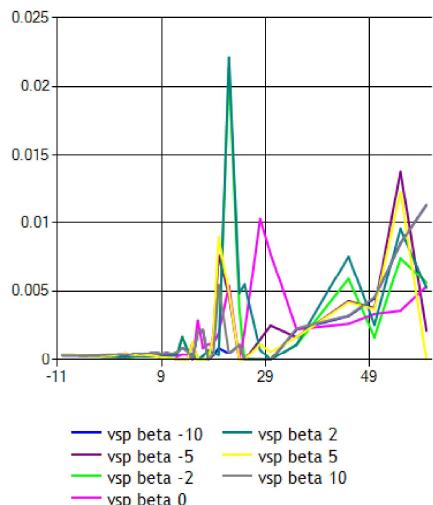
CFXPROWPASH (alpha,beta,Vind=48)



DRAG INCREMENT DUE TO GEAR

CFXGEAR(alpha,beta)

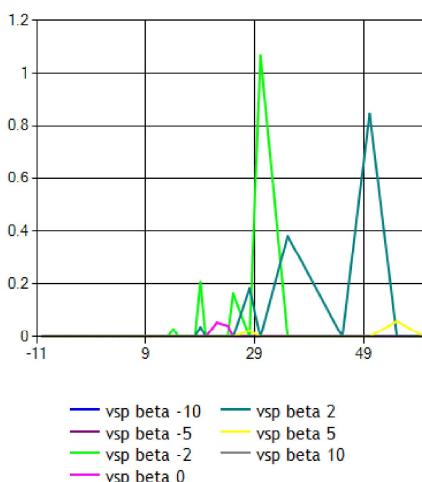
CFXGEAR*gear/gear-pos-norm



DRAG INCREMENT DUE TO WING DAMAGE

CFXWINGA(alpha,beta)

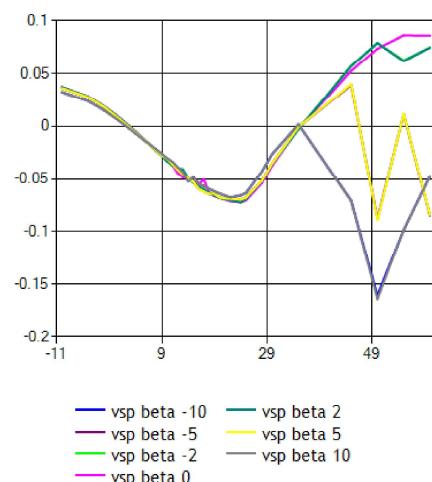
CFXWINGA*winga

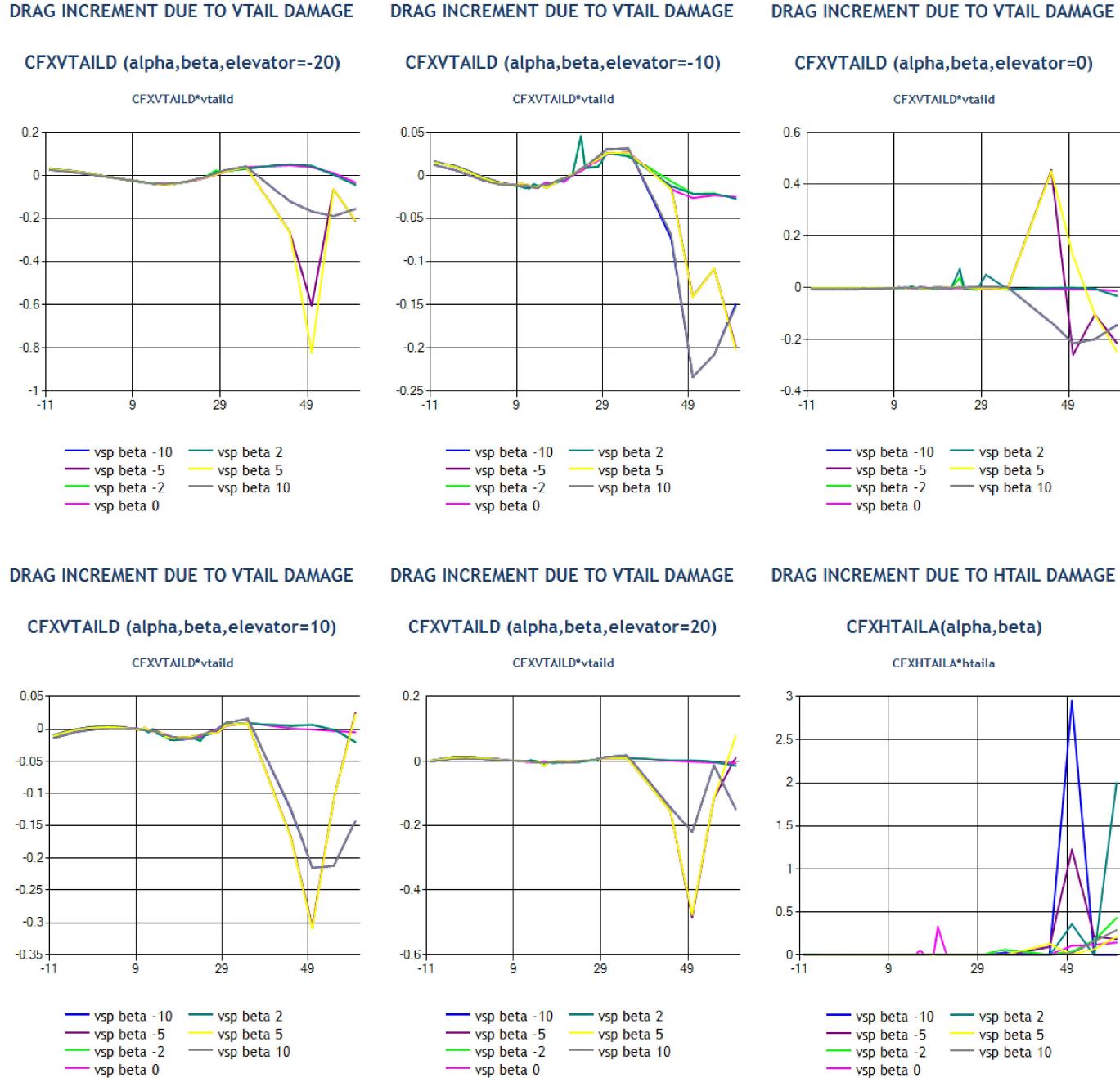


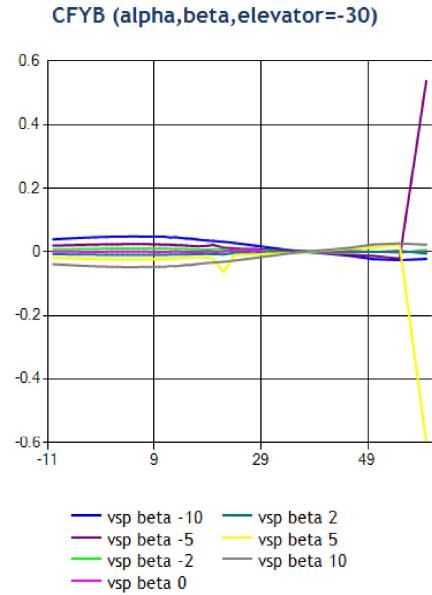
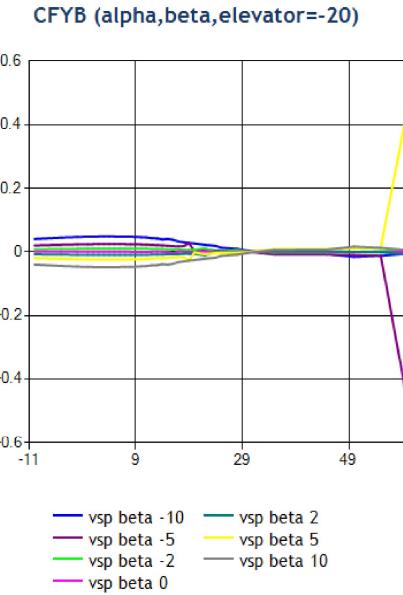
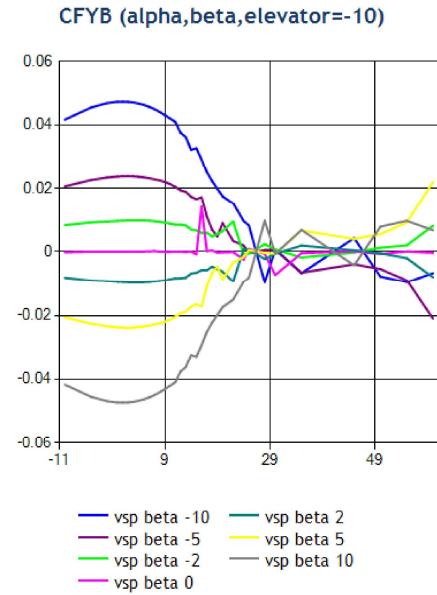
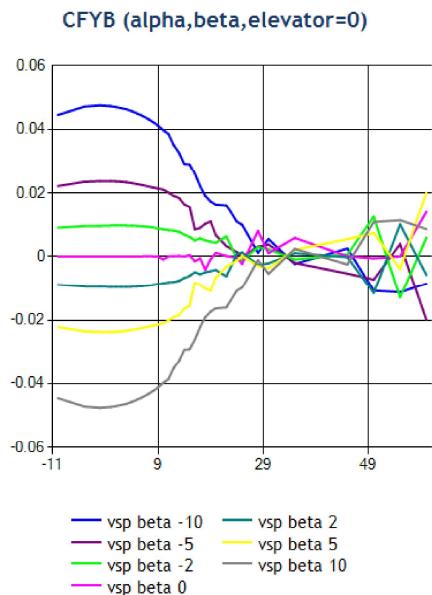
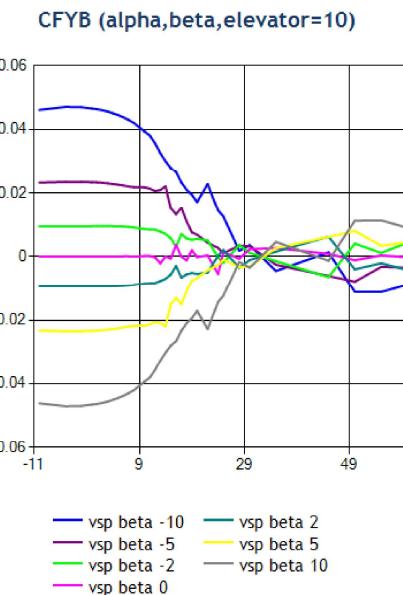
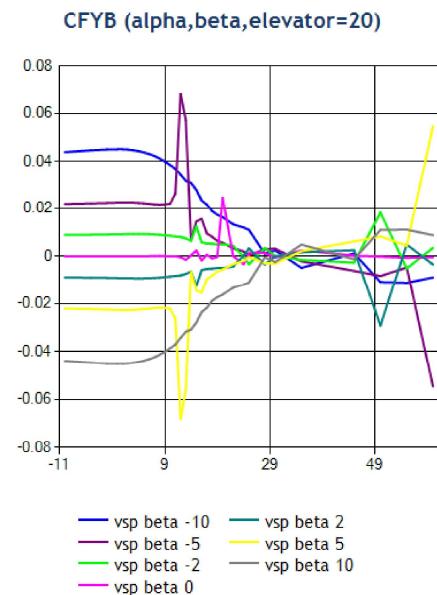
DRAG INCREMENT DUE TO VTAIL DAMAGE

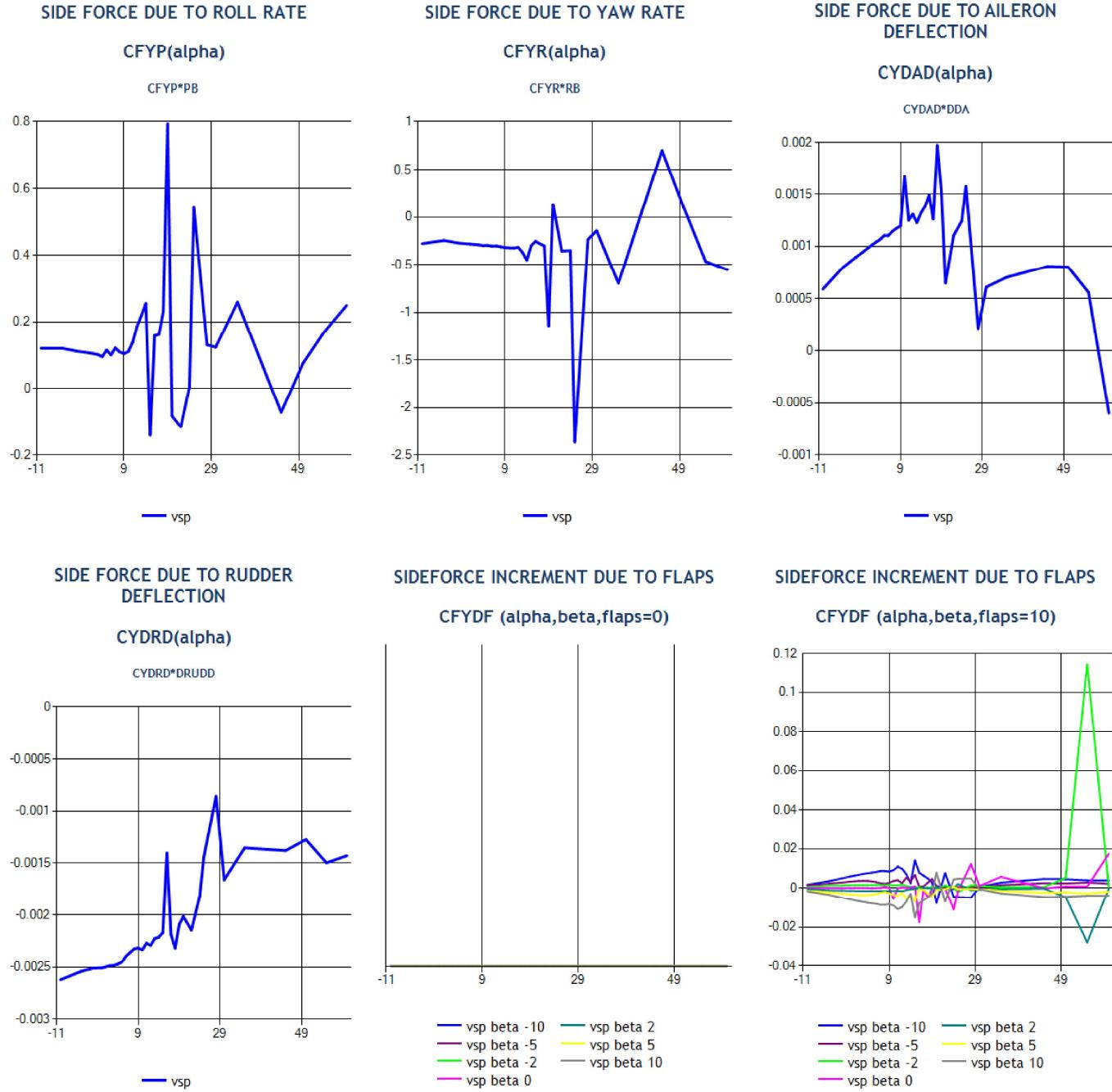
CFXVTAILD (alpha,beta,elevator=-30)

CFXVTAILD*vtaild



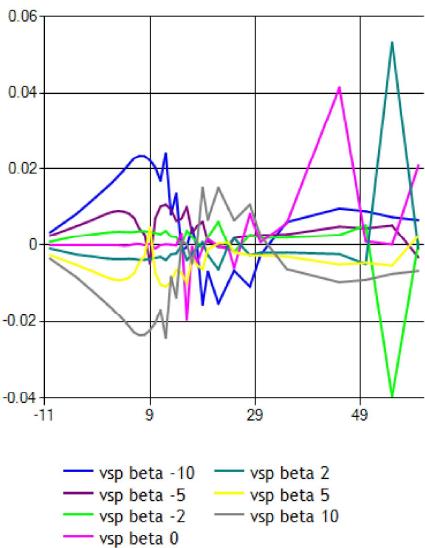


SIDE**BASIC SIDE FORCE****BASIC SIDE FORCE****BASIC SIDE FORCE****BASIC SIDE FORCE****BASIC SIDE FORCE****BASIC SIDE FORCE**



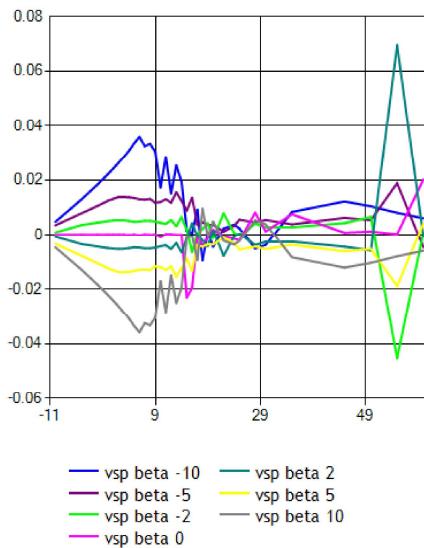
SIDEFORCE INCREMENT DUE TO FLAPS

CFYDF (alpha,beta,flaps=24)



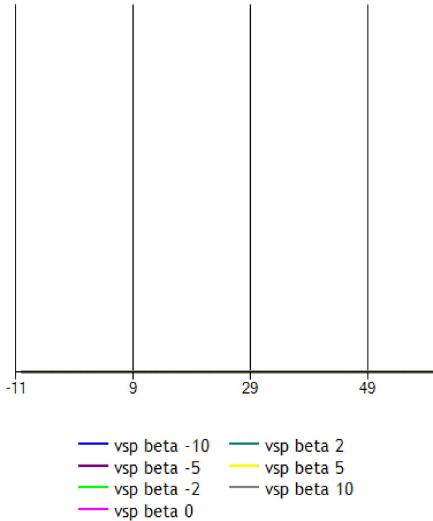
SIDEFORCE INCREMENT DUE TO FLAPS

CFYDF (alpha,beta,flaps=38)



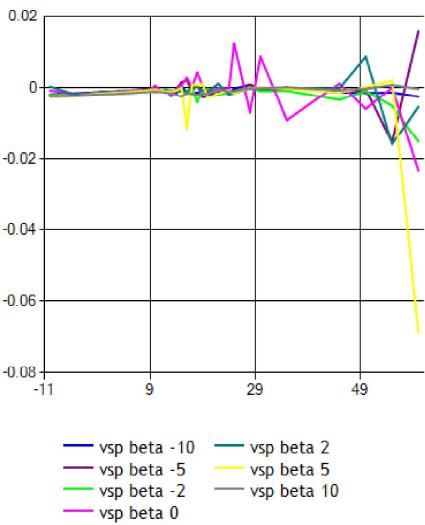
SIDE FORCE INCREMENT DUE TO PROPWASH

CFYPROPWASH (alpha,beta,Vind=0)



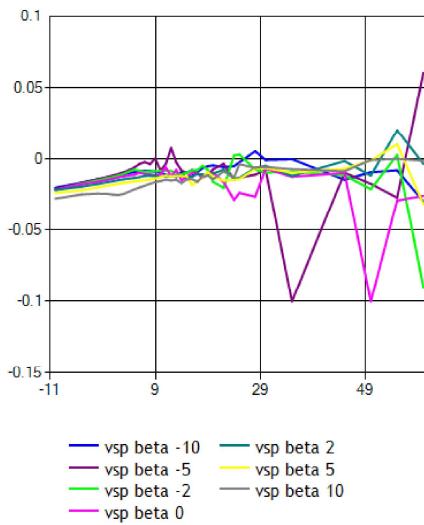
SIDE FORCE INCREMENT DUE TO PROPWASH

CFYPROPWASH (alpha,beta,Vind=1)



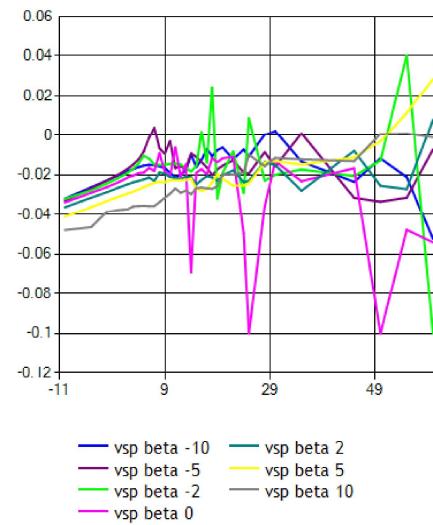
SIDE FORCE INCREMENT DUE TO PROPWASH

CFYPROPWASH (alpha,beta,Vind=16)



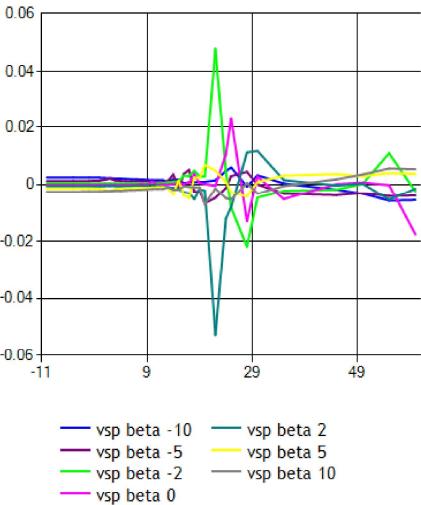
SIDE FORCE INCREMENT DUE TO PROPWASH

CFYPROPWASH (alpha,beta,Vind=48)

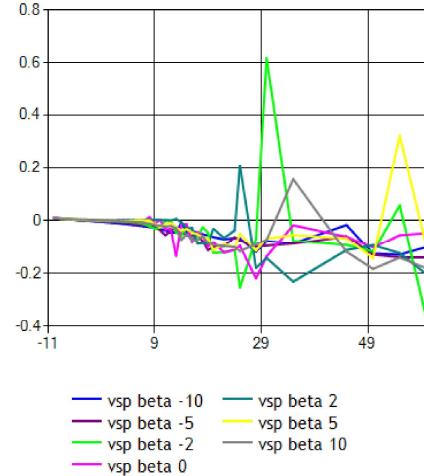


SIDE FORCE INCREMENT DUE TO GEAR**CFYGEAR(alpha,beta)**

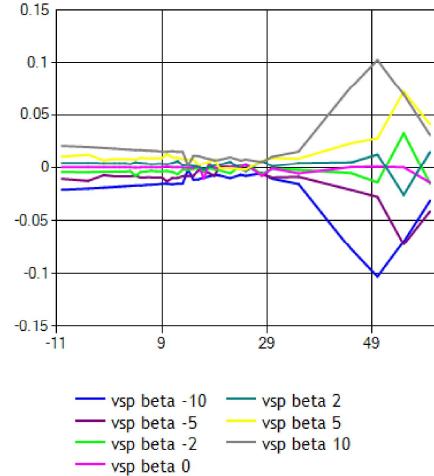
CFYGEAR*gear/gear-pos-norm

**SIDE FORCE INCREMENT DUE TO WING DAMAGE****CFYWINGA(alpha,beta)**

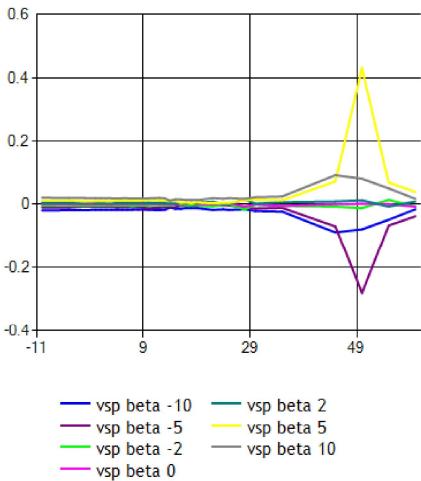
CFYWINGA*winga

**SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE****CFYVTAILD (alpha,beta,elevator=-30)**

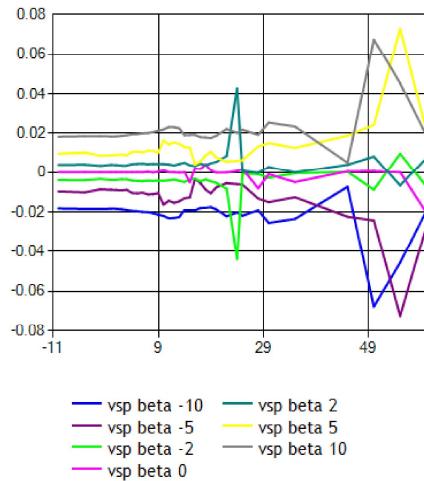
CFYVTAILD*vtaild

**SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE****CFYVTAILD (alpha,beta,elevator=-20)**

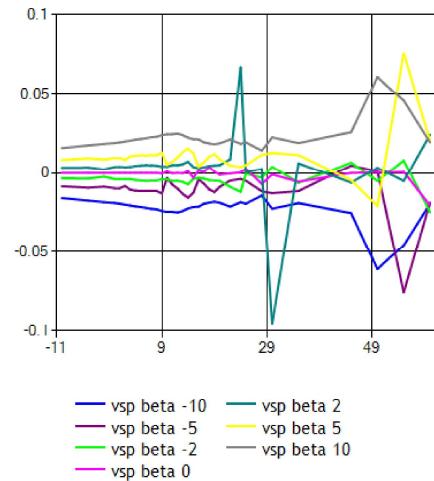
CFYVTAILD*vtaild

**SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE****CFYVTAILD (alpha,beta,elevator=-10)**

CFYVTAILD*vtaild

**SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE****CFYVTAILD (alpha,beta,elevator=0)**

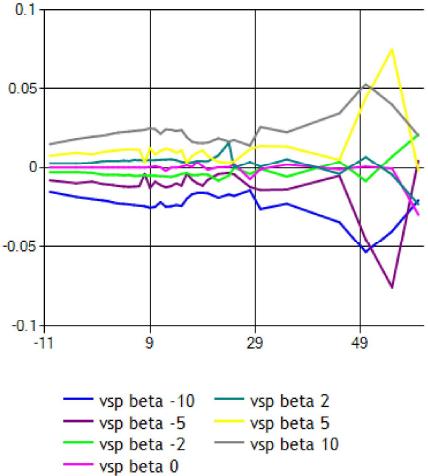
CFYVTAILD*vtaild



SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE

CFYVTAILD (alpha,beta,elevator=10)

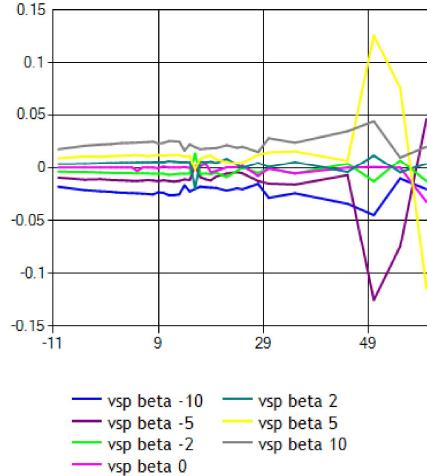
CFYVTAILD*vtaild



SIDE FORCE INCREMENT DUE TO VTAIL DAMAGE

CFYVTAILD (alpha,beta,elevator=20)

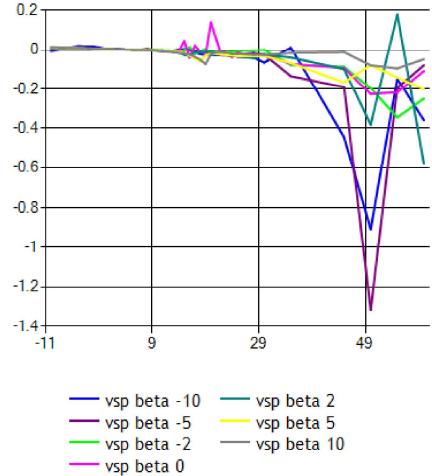
CFYVTAILD*vtaild



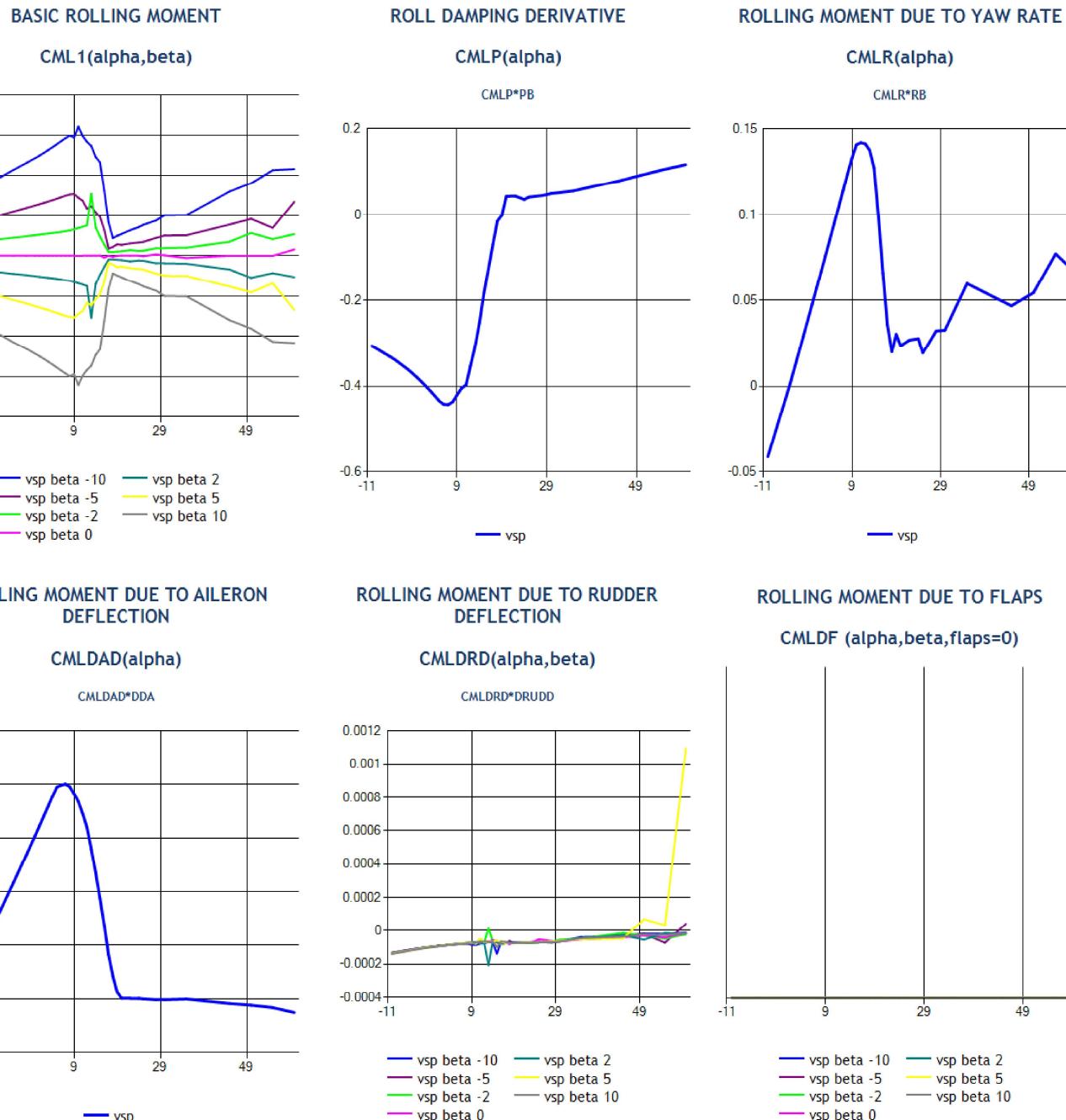
SIDE FORCE INCREMENT DUE TO HTAIL DAMAGE

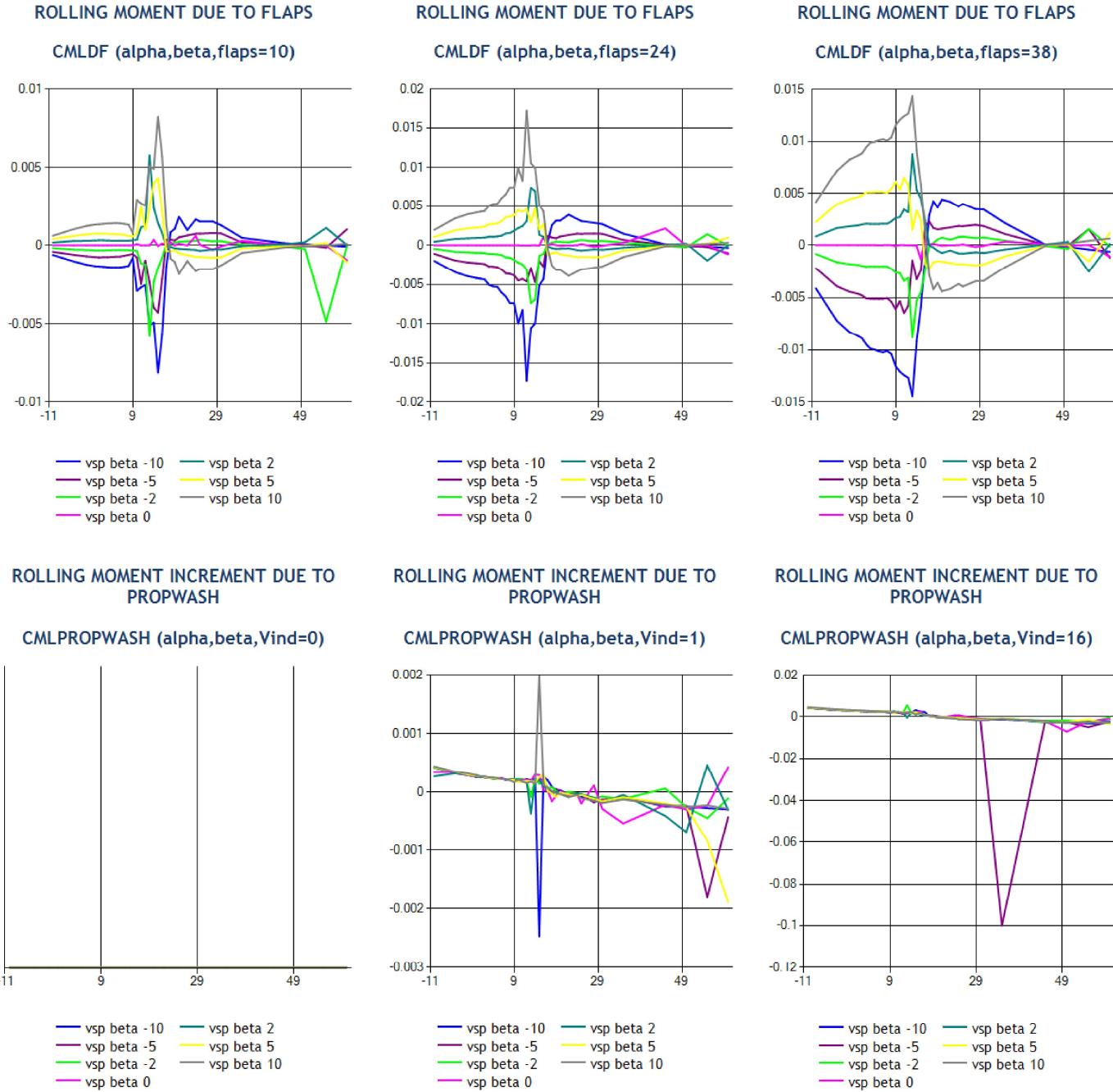
CFYHTAILA(alpha,beta)

CFYHTAILA*htaila



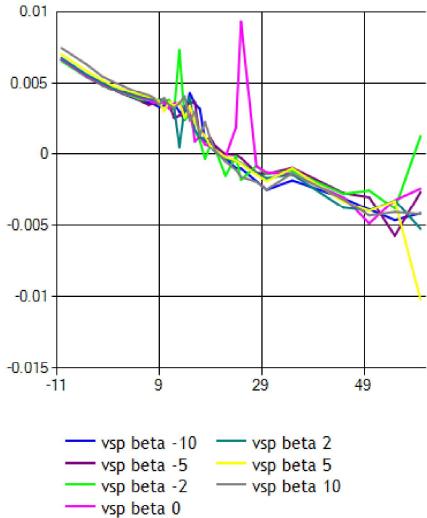
ROLL





ROLLING MOMENT INCREMENT DUE TO PROPWASH

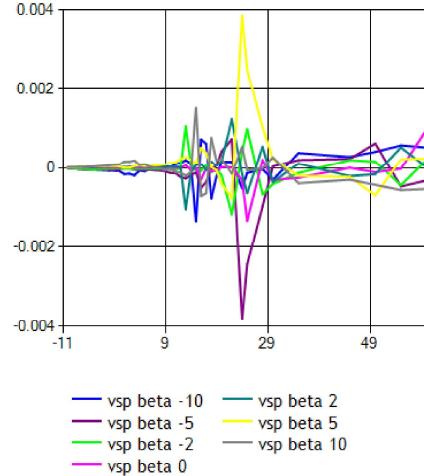
CMLPROPWASH (alpha,beta,Vind=48)



ROLLING MOMENT INCREMENT DUE TO GEAR

CMLGEAR(alpha,beta)

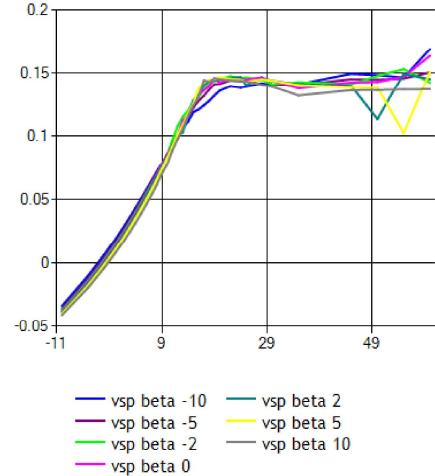
CMLGEAR*gear/gear-pos-norm



ROLLING MOMENT INCREMENT DUE TO WING DAMAGE

CMLWINGA(alpha,beta)

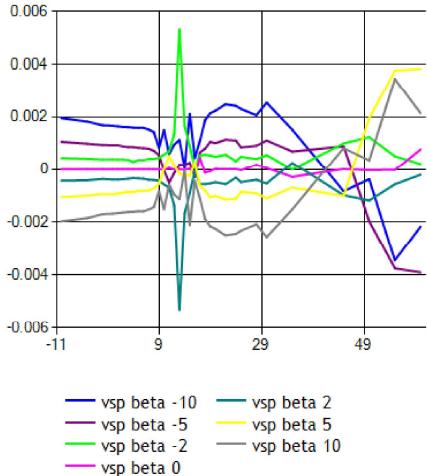
CMLWINGA*winga



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=-30)

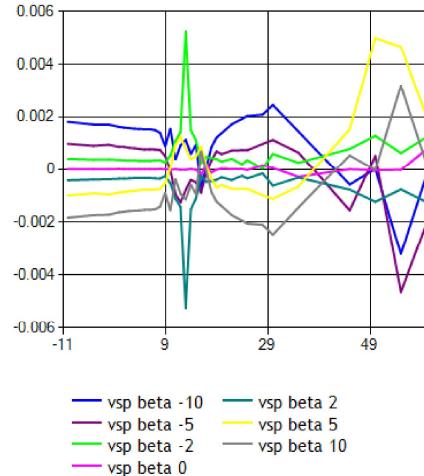
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=-20)

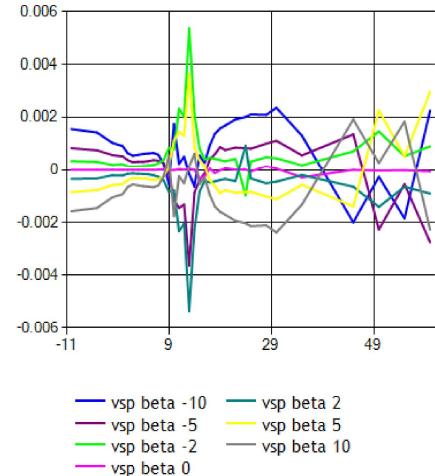
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=-10)

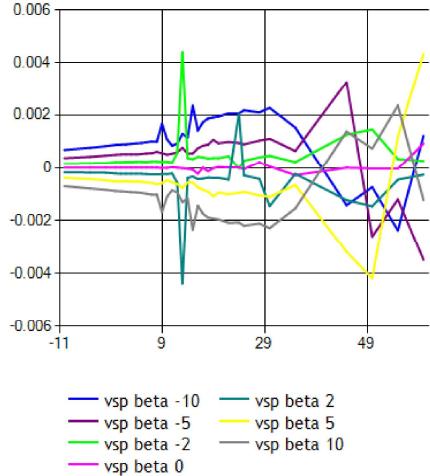
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=0)

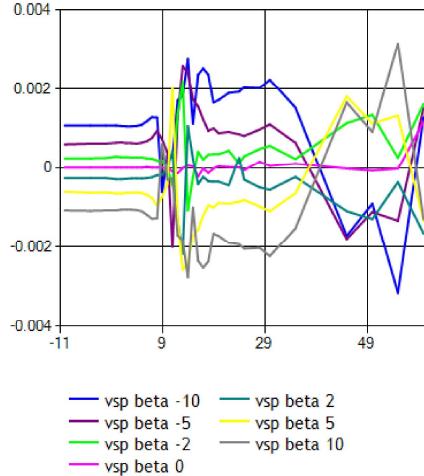
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=10)

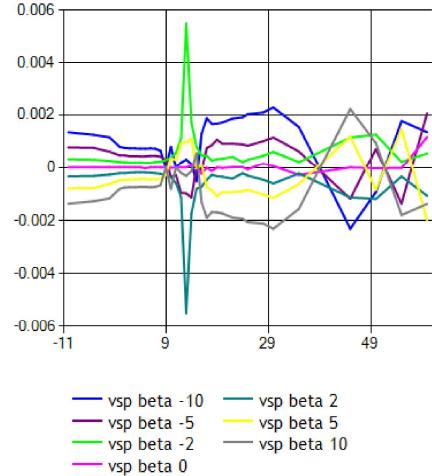
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMLVTAILD (alpha,beta,elevator=20)

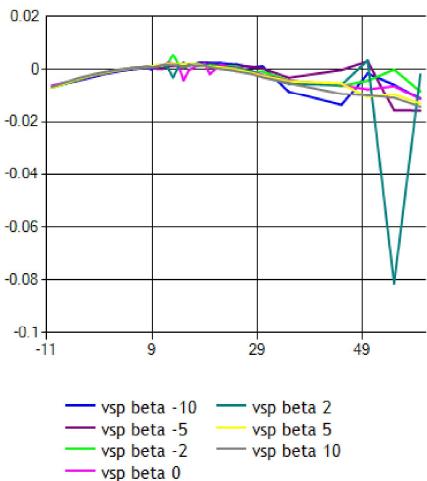
CMLVTAILD*vtaild



ROLLING MOMENT INCREMENT DUE TO HTAIL DAMAGE

CMLHTAILA(alpha,beta)

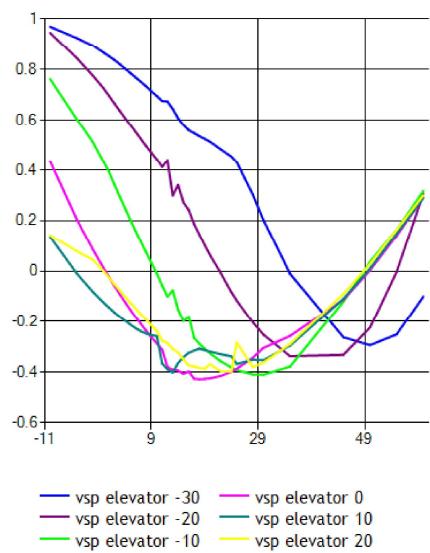
CMLHTAILA*htaila



PITCH

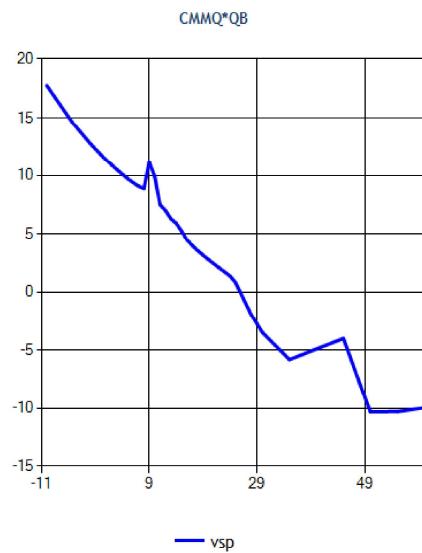
BASIC PITCHING MOMENT

CMM1(alpha,elevator)



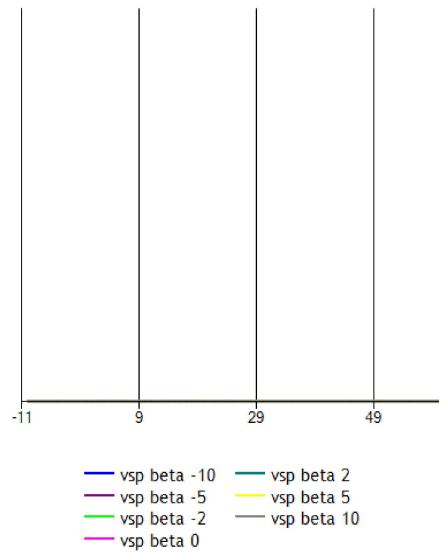
PITCH DAMPING DERIVATIVE

CMMQ(alpha)



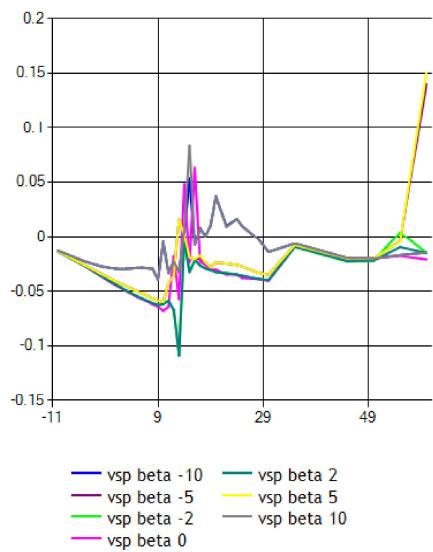
PITCHING MOMENT DUE TO FLAPS

CMMDF (alpha,beta,flaps=0)



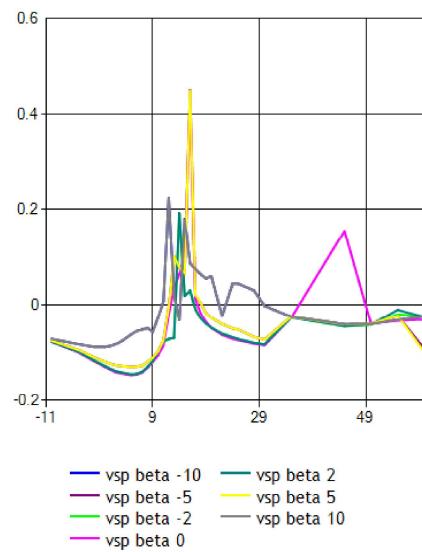
PITCHING MOMENT DUE TO FLAPS

CMMDF (alpha,beta,flaps=10)



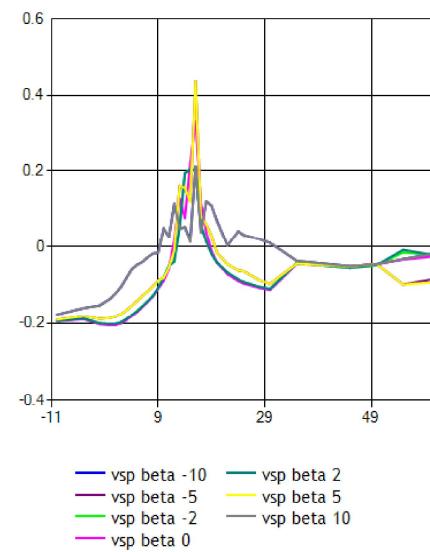
PITCHING MOMENT DUE TO FLAPS

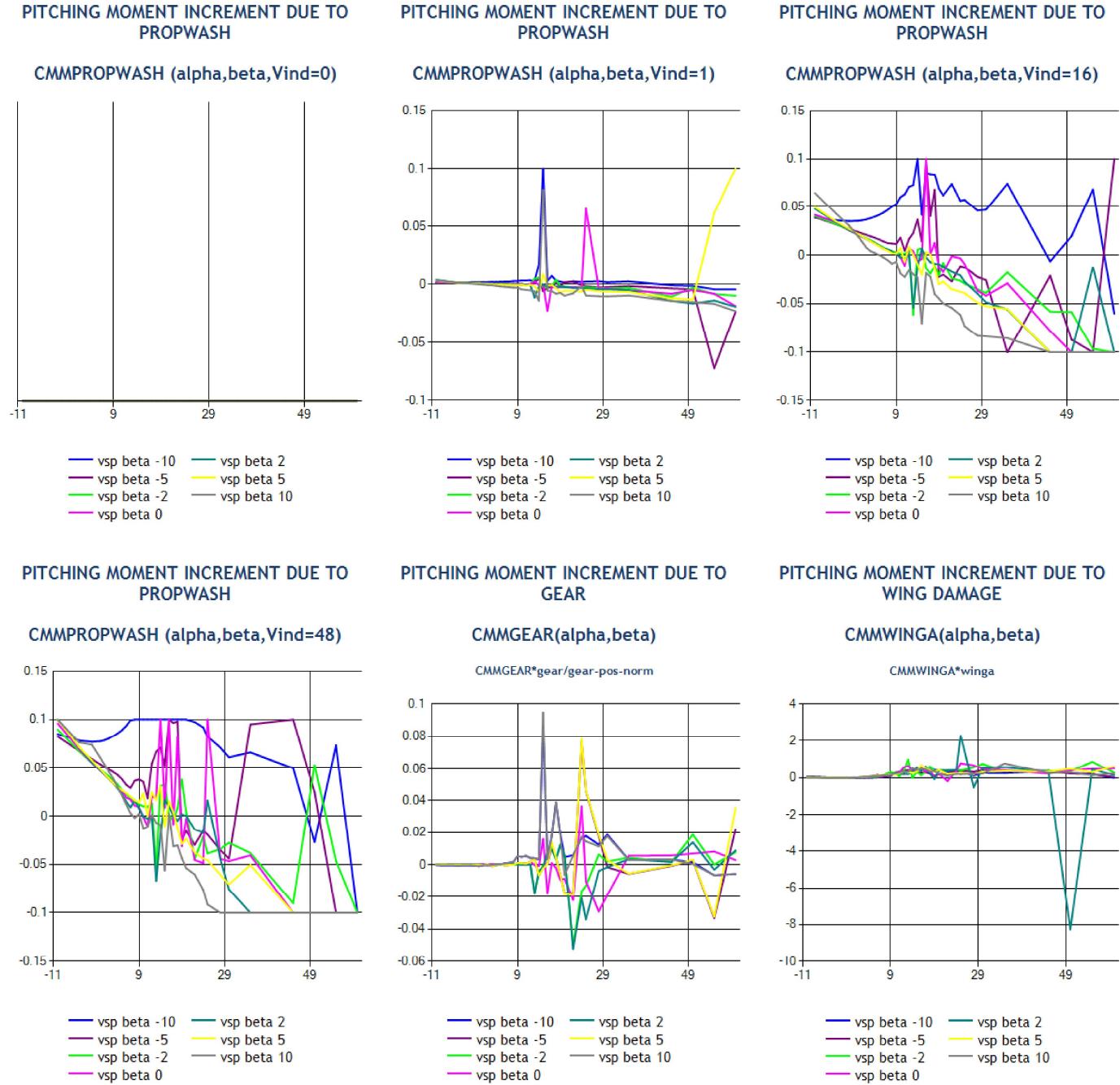
CMMDF (alpha,beta,flaps=24)



PITCHING MOMENT DUE TO FLAPS

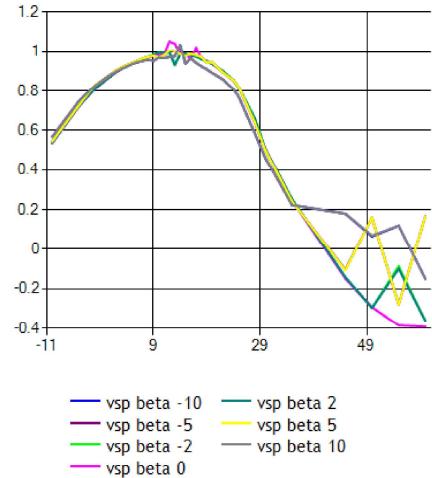
CMMDF (alpha,beta,flaps=38)



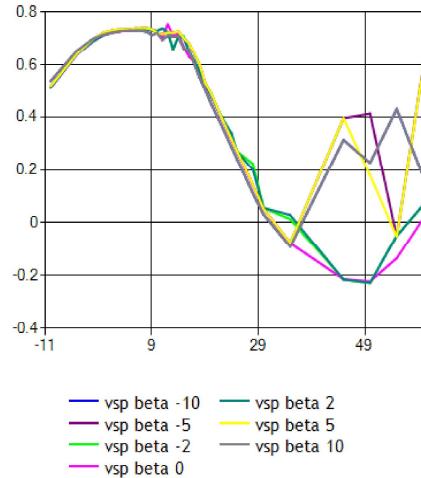


PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE**CMMVTAILD (alpha,beta,elevator=-30)**

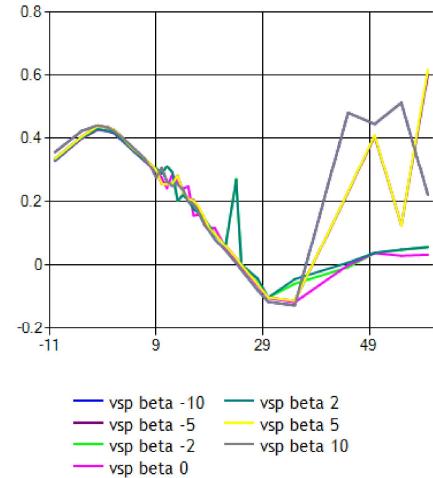
CMMVTAILD*vtaild

**PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE****CMMVTAILD (alpha,beta,elevator=-20)**

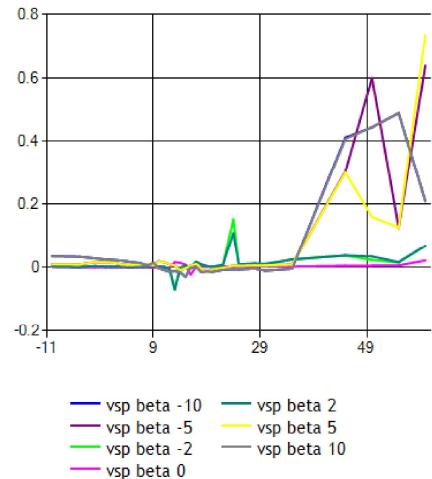
CMMVTAILD*vtaild

**PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE****CMMVTAILD (alpha,beta,elevator=-10)**

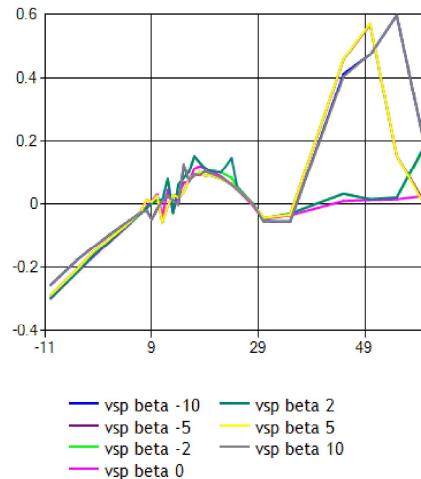
CMMVTAILD*vtaild

**PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE****CMMVTAILD (alpha,beta,elevator=0)**

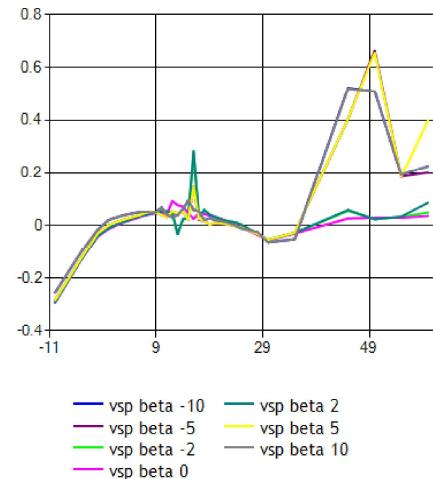
CMMVTAILD*vtaild

**PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE****CMMVTAILD (alpha,beta,elevator=10)**

CMMVTAILD*vtaild

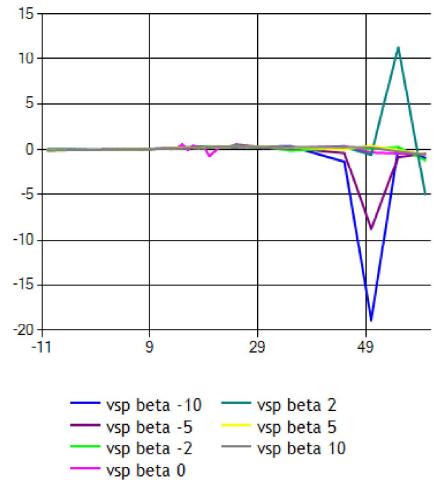
**PITCHING MOMENT INCREMENT DUE TO VTAIL DAMAGE****CMMVTAILD (alpha,beta,elevator=20)**

CMMVTAILD*vtaild

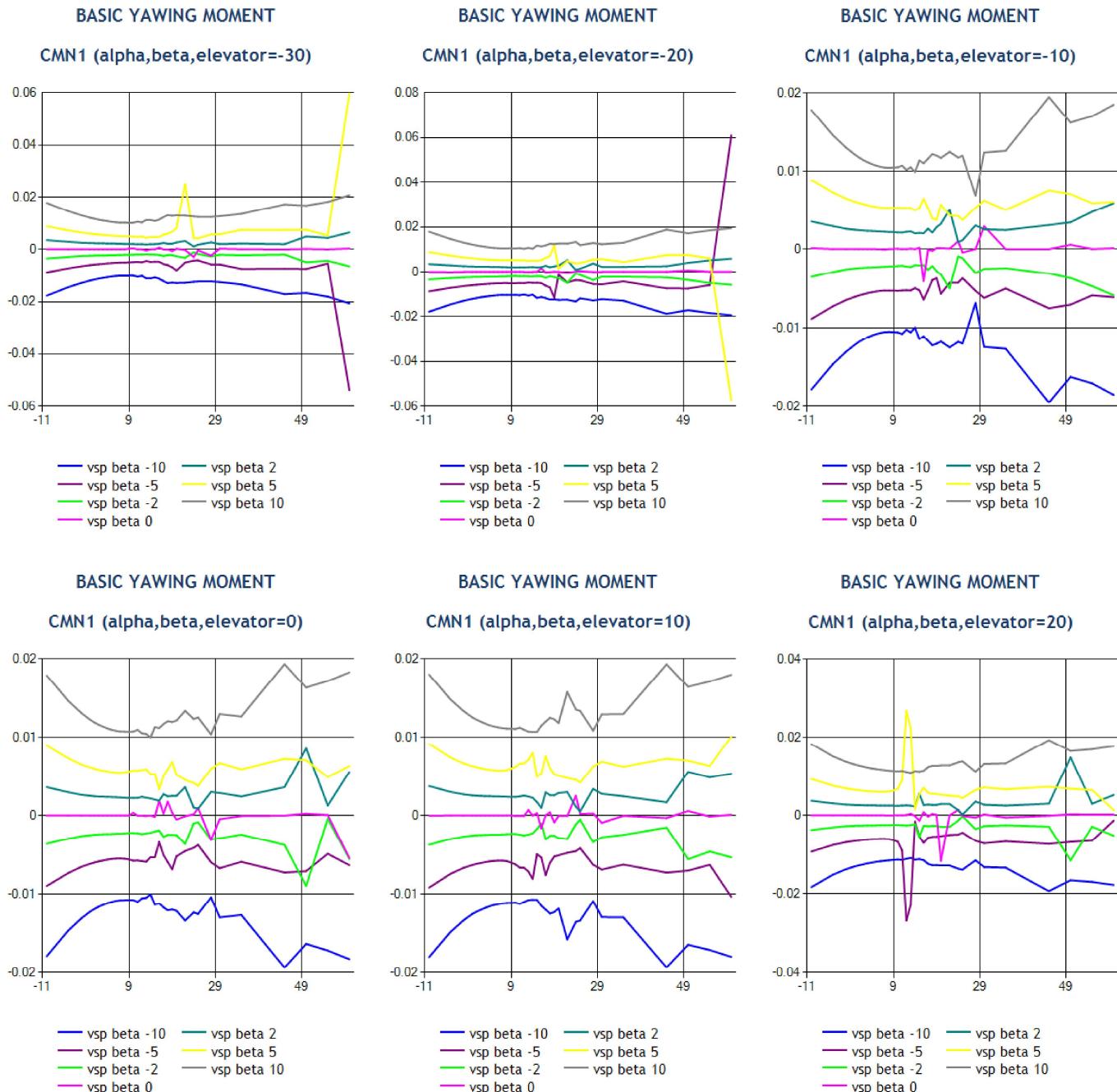


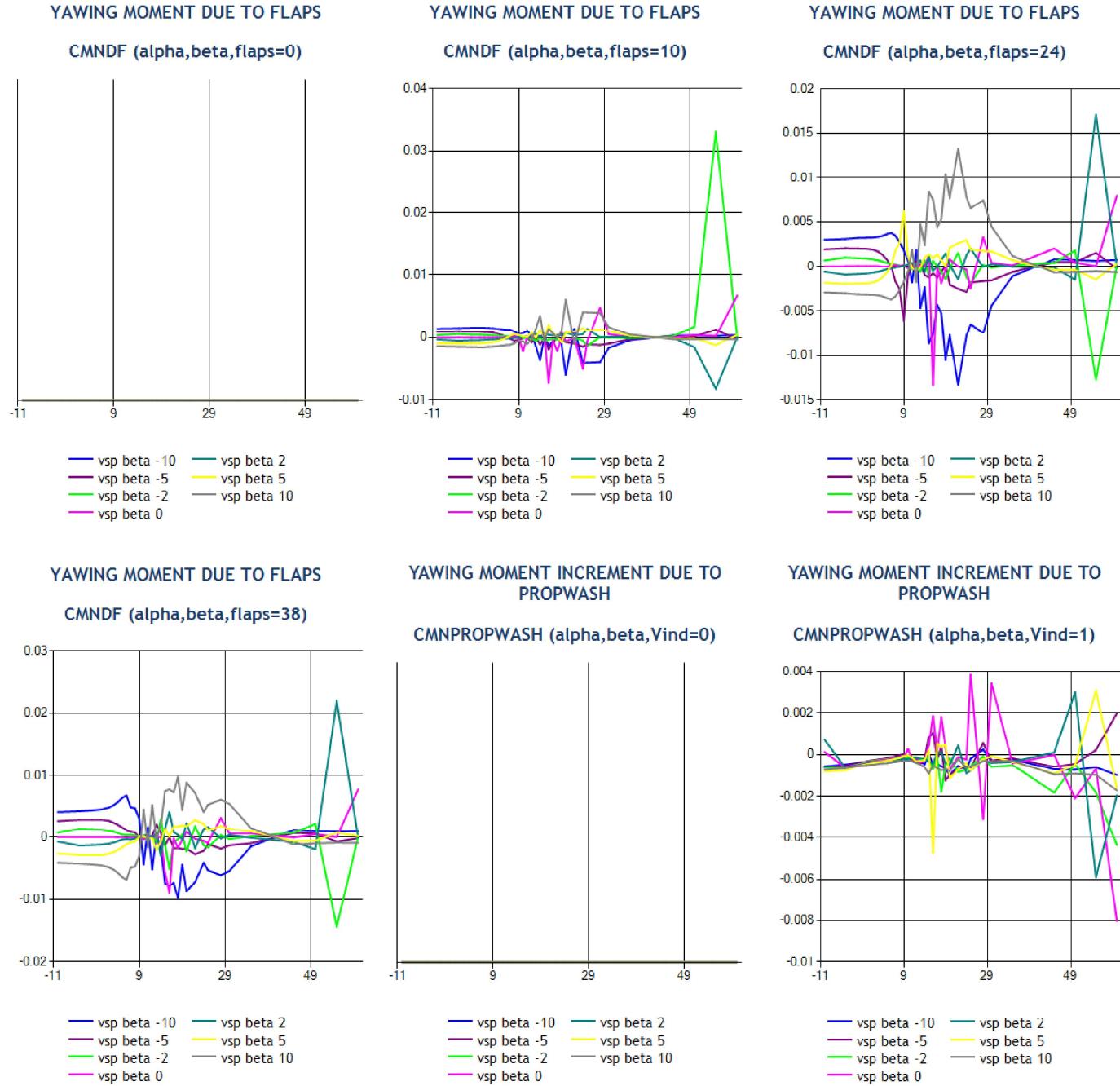
**PITCHING MOMENT INCREMENT DUE TO
HTAIL DAMAGE****CMMHTAILA(alpha,beta)**

CMMHTAILA*htaila



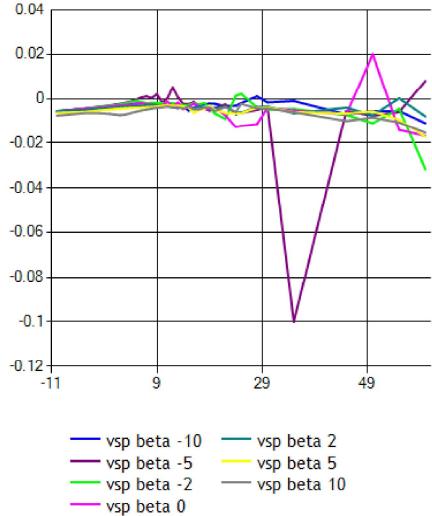
YAW





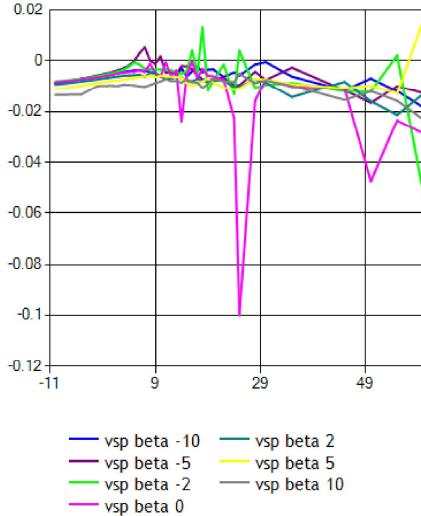
YAWING MOMENT INCREMENT DUE TO PROWPASH

CMNPROWPASH (alpha,beta,Vind=16)



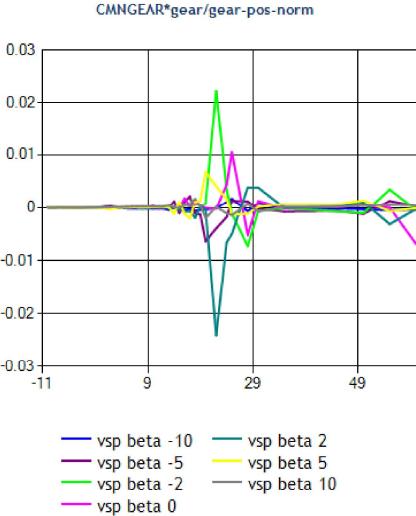
YAWING MOMENT INCREMENT DUE TO PROWPASH

CMNPROWPASH (alpha,beta,Vind=48)



YAWING MOMENT INCREMENT DUE TO GEAR

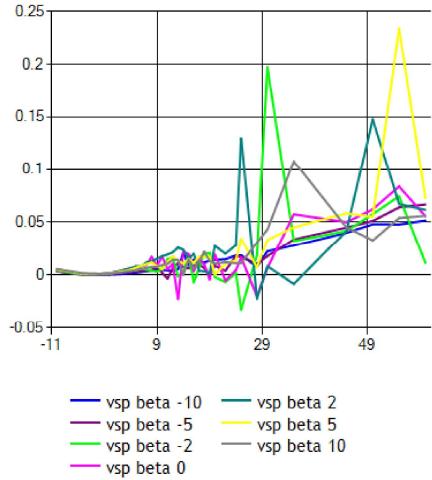
CMNGEAR(alpha,beta)



YAWING MOMENT INCREMENT DUE TO WING DAMAGE

CMNWINGA(alpha,beta)

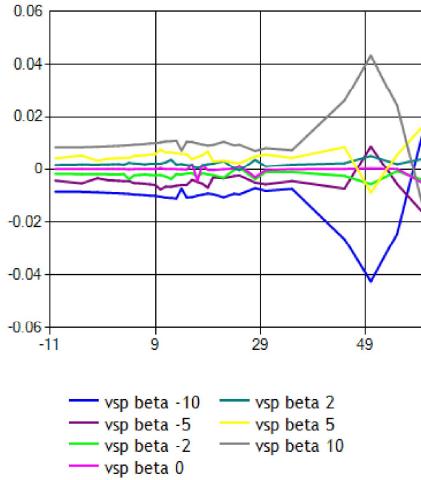
CMNWINGA*winga



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=-30)

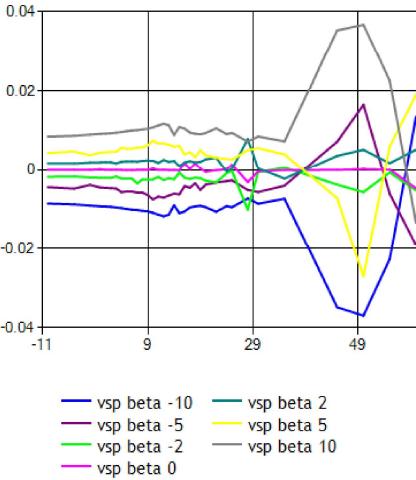
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=-20)

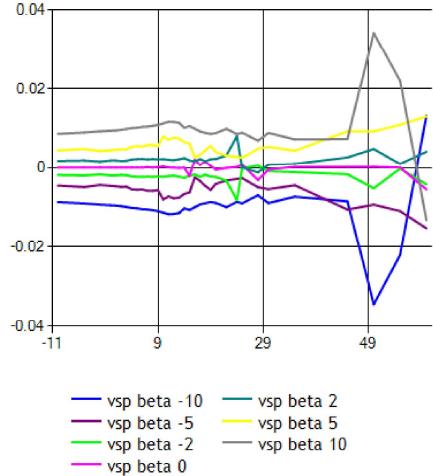
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=-10)

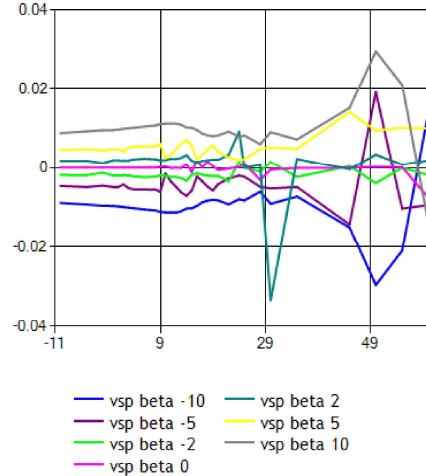
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=0)

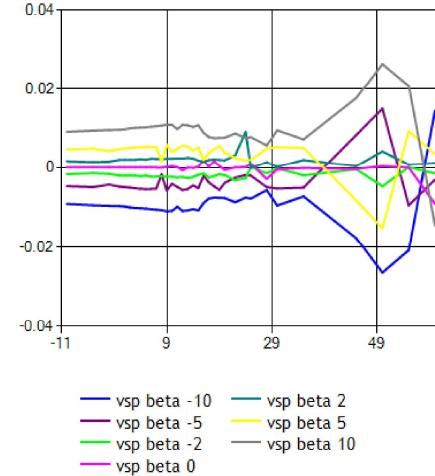
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=10)

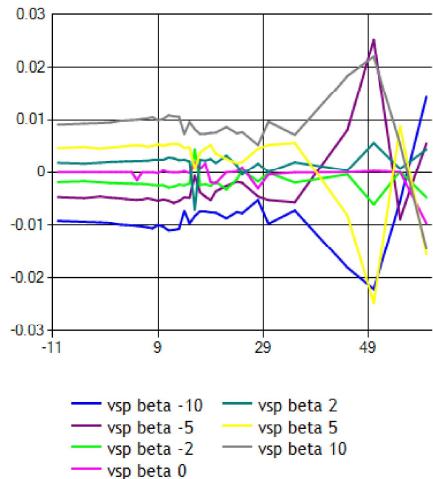
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO VTAIL DAMAGE

CMNVTAILD (alpha,beta,elevator=20)

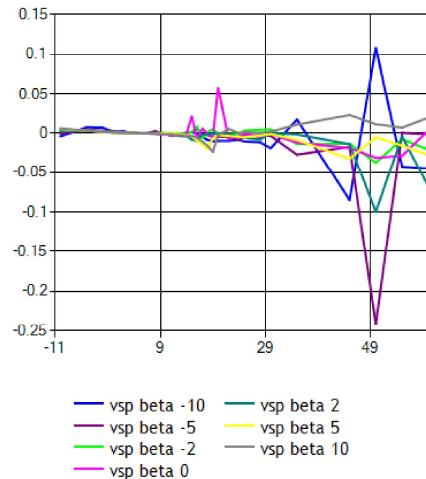
CMNVTAILD*vtaild



YAWING MOMENT INCREMENT DUE TO HTAIL DAMAGE

CMNHTAILA(alpha,beta)

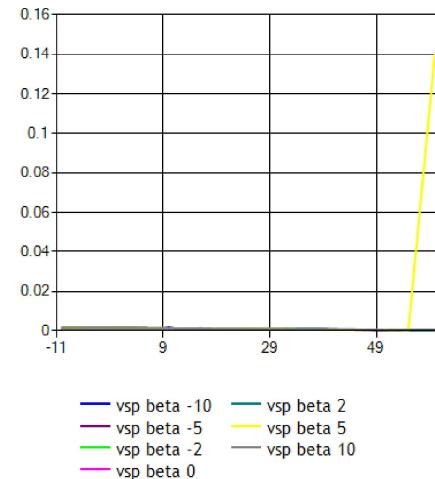
CMNHTAILA*htaila

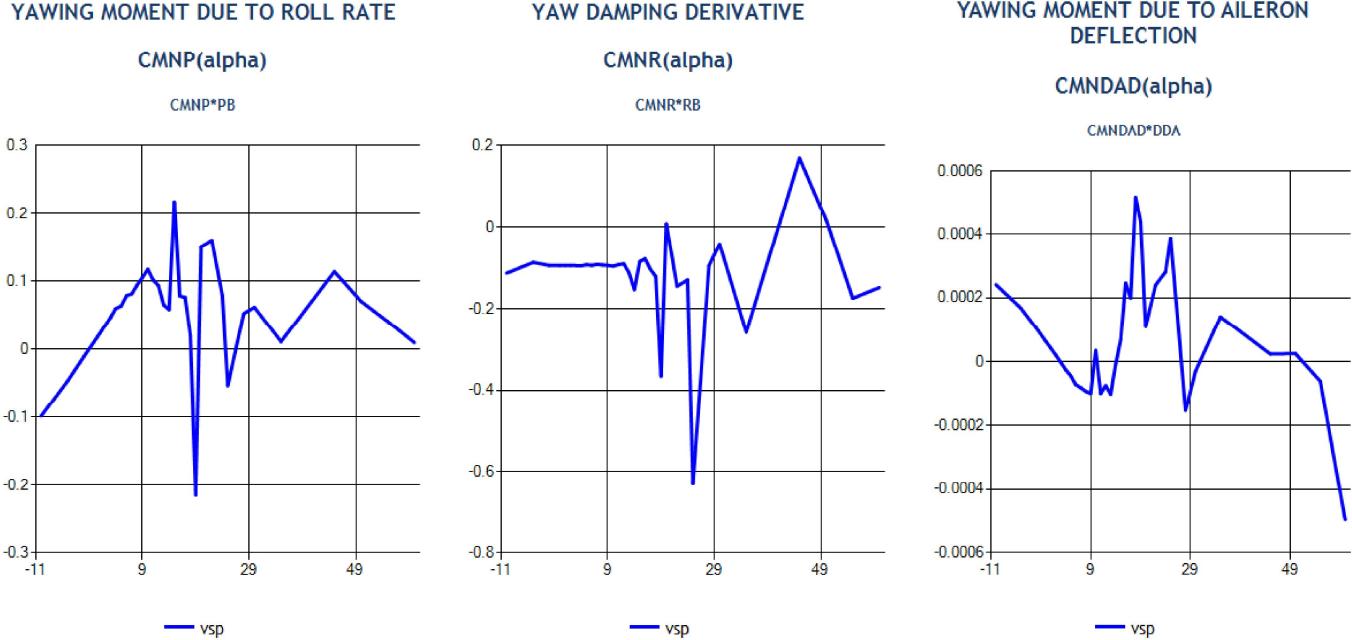


YAWING MOMENT DUE TO RUDDER DEFLECTION

CMNDRDR(alpha,beta)

CMNDRDR*D Rudd





Drag Coefficient Buildup

DRAG=CFXDF+CFXPROPWASH+CFXGEAR*gear/gear-pos-norm+CFXWINGA*winga+CFXVTAILD*vtaild+CFXHTAILA*htaila+CFXB

Side Coefficient Buildup

SIDE=CFYDF+CFYPROPWASH+CFYGEAR*gear/gear-pos-norm+CFYWINGA*winga+CFYVTAILD*vtaild+CFYHTAILA*htaila+CFYB+CYDAD*DDA+CYDRD*DRUDD+CFYP*PB+CFYR*RB

Lift Coefficient Buildup

LIFT=CFZDF+CFZPROPWASH+CFZGEAR*gear/gear-pos-norm+CFZWINGA*winga+CFZVTAILD*vtaild+CFZHTAILA*htaila+CFZB

Roll Coefficient Buildup

ROLL=CMLDF+CMLPROPWASH+CMLGEAR*gear/gear-pos-norm+CMLWINGA*winga+CMLVTAILD*vtaild+CMLHTAILA*htaila+CML1+CMLDAD*DDA+CMLDRD*DRUDD+CMLP*PB+CMLR*RB + (DLNB*BETA)

Pitch Coefficient Buildup

PITCH=CMMDF+CMMPROPWASH+CMMGEAR*gear/gear-pos-norm+CMMWINGA*winga+CMMVTAILD*vtaild+CMMHTAILA*htaila+CMM1+CMMQ*QB

Yaw Coefficient Buildup

YAW=CMNDF+CMNPROPWASH+CMNGEAR*gear/gear-pos-norm+CMNWINGA*winga+CMNVTAILD*vtaild+CMNHTAILA*htaila+CMN1+CMNDAD*DDA+CMNDRDr*DRUDD+CMNP*PB+CMNR*RB + (DCNB*BETA)

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- Simon 'bomber' Morley (simonbomber64@gmail.com): Beagle Pup Aerodynamics, Beagle_Pup, 2016
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Mass and balance

Element	X	Y	Z	Unit
Aerodynamic Reference Point (CoP)	6.00	0.00	0.50	FT
Aircraft CG	5.00	0.00	-0.50	FT
Element	Unit			
I _{XX}			4282.38	SLUG*FT ²
I _{YY}			21959.71	SLUG*FT ²
I _{ZZ}			24445.93	SLUG*FT ²
I _{XZ}			903.71	SLUG*FT ²
Element	X	Y	Z	Unit
				Weight

Ground Reactions

Element	X	Y	Z	Unit
NoseGear	3.25	0.00	-4.32	FT
LeftMainGear	7.97	-4.21	-4.27	FT
RightMainGear	7.97	4.21	-4.27	FT
WingLeftLeadingEdge	6.76	-15.80	0.49	FT
WingRightLeadingEdge	6.76	15.80	0.49	FT
WingLeftTrailingEdge	9.23	-15.56	0.52	FT
WingRightTrailingEdge	9.23	15.56	0.52	FT
HTailLeftEdge	20.69	-5.38	0.71	FT
HTailRightEdge	20.69	5.38	0.71	FT
HtailLower	18.39	0.00	-1.36	FT
VtailLower	22.93	0.00	-0.39	FT
VtailUpper	22.93	0.00	4.40	FT
VtailUpperLeadingEdge	20.73	0.00	4.38	FT
Fuselage	8.03	0.00	2.44	FT
PropellerCentre	0.22	0.00	0.00	FT

Metrics

Element	Unit
Chord	4.66 FT
Wingspan	31.00 FT
Wing Area	144.36 FT ²

Element		Unit
Wing Incidence	0.00	DEG
ClMax	1.63	ND

Propulsion

Element	X	Y	Z	Unit	Feed
Continental-O200-A	0.00	0.00	0.00	FT	Wing Tank L [0],Wing Tank R [1],Manifold [2]

Tanks

Element	X	Y	Z	Unit	Capacity	Id	Priority	Standpipe
Wing Tank L	7.86	-5.64	-0.71	FT	87 LBS	0	1	1 LBS
Wing Tank R	7.86	5.64	-0.71	FT	87 LBS	1	2	1 LBS
Manifold	5.00	0.00	0.00	FT	5 LBS	2	3	1 LBS

Systems

Name
fuel
Beagle-Pup-controls
Beagle-Pup-flight-controls