Table of Contents


```
clc; clear; close all
Exp3data = importfile("C:\Users\jtmil\OneDrive\Desktop\Cal Poly Pomona\CPP
GIT\ARO 4351L - Wind Tunnel Lab\Exp #3\Exp 3 FM Run All rev a.xlsx", "Exp
3 FM Run All rev a", [1, Inf]);
```

Velocity in ft/s for different velocity:

```
team0data_Velfs = Exp3data.VelFs(4:16);  % V = 0
team1data_Velfs = Exp3data.VelFs(17:28);  % V = 100
team2data_Velfs = Exp3data.VelFs(29:40);  % V = 150
team3data_Velfs = Exp3data.VelFs(41:52);  % V = 175
team4data_Velfs = Exp3data.VelFs(53:64);  % V = 200
team5data_Velfs = Exp3data.VelFs(65:76);  % V = 220
```

Velocity in m/s for different velocity:

```
team0data_VelMs = Exp3data.Vel_SIMs(4:16);  % V = 0
team1data_VelMs = Exp3data.Vel_SIMs(17:28);  % V = 100
team2data_VelMs = Exp3data.Vel_SIMs(29:40);  % V = 150
team3data_VelMs = Exp3data.Vel_SIMs(41:52);  % V = 175
team4data_VelMs = Exp3data.Vel_SIMs(53:64);  % V = 200
team5data_VelMs = Exp3data.Vel_SIMs(65:76);  % V = 220
```

P_inf (PSI) for different velocity

```
team0data_PinfPsi = Exp3data.PinfPsi(4:16);  % V = 0
team1data_PinfPsi = Exp3data.PinfPsi(17:28);  % V = 100
team2data_PinfPsi = Exp3data.PinfPsi(29:40);  % V = 150
team3data_PinfPsi = Exp3data.PinfPsi(41:52);  % V = 175
team4data_PinfPsi = Exp3data.PinfPsi(53:64);  % V = 200
team5data_PinfPsi = Exp3data.PinfPsi(65:76);  % V = 220
```

P_inf (kPa) for different velocity

```
team0data_PinfkPa = Exp3data.Pinf_SIKPa(4:16);  % V = 0
team1data_PinfkPa = Exp3data.Pinf_SIKPa(17:28);  % V = 100
team2data_PinfkPa = Exp3data.Pinf_SIKPa(29:40);  % V = 150
team3data_PinfkPa = Exp3data.Pinf_SIKPa(41:52);  % V = 175
team4data_PinfkPa = Exp3data.Pinf_SIKPa(53:64);  % V = 200
team5data_PinfkPa = Exp3data.Pinf_SIKPa(65:76);  % V = 220
```

Temp (C) for different velocity

```
team0data_Mach = Exp3data.Mach(4:16);  % V = 0
team1data_Mach = Exp3data.Mach(17:28);  % V = 100
team2data_Mach = Exp3data.Mach(29:40);  % V = 150
team3data_Mach = Exp3data.Mach(41:52);  % V = 175
team4data_Mach = Exp3data.Mach(53:64);  % V = 200
team5data_Mach = Exp3data.Mach(65:76);  % V = 220
```

Mach for different velocity

```
team0data_T = Exp3data.Temp_SIC(4:16);  % V = 0
team1data_T = Exp3data.Temp_SIC(17:28);  % V = 100
team2data_T = Exp3data.Temp_SIC(29:40);  % V = 150
team3data_T = Exp3data.Temp_SIC(41:52);  % V = 175
team4data_T = Exp3data.Temp_SIC(53:64);  % V = 200
team5data_T = Exp3data.Temp_SIC(65:76);  % V = 220
```

Normal Force for different velocity:

```
team0data_NF = Exp3data.NF(4:15);  % V = 0
team1data_NF = Exp3data.NF(17:28);  % V = 100
team2data_NF = Exp3data.NF(29:40);  % V = 150
team3data_NF = Exp3data.NF(41:52);  % V = 175
team4data_NF = Exp3data.NF(53:64);  % V = 200
team5data_NF = Exp3data.NF(65:76);  % V = 220
```

Pitching Moment for different velocity

```
team0data_PM = Exp3data.PM(4:15);  % V = 0
team1data_PM = Exp3data.PM(17:28);  % V = 100
```

```
team2data_PM = Exp3data.PM(29:40);  % V = 150
team3data_PM = Exp3data.PM(41:52);  % V = 175
team4data_PM = Exp3data.PM(53:64);  % V = 200
team5data_PM = Exp3data.PM(65:76);  % V = 220
```

Side Force for different velocity

```
team0data_SF = Exp3data.SF(4:15);  % V = 0
team1data_SF = Exp3data.SF(17:28); % V = 100
team2data_SF = Exp3data.SF(29:40);  % V = 150
team3data_SF = Exp3data.SF(41:52);  % V = 175
team4data_SF = Exp3data.SF(53:64);  % V = 200
team5data_SF = Exp3data.SF(65:76);  % V = 220
```

Yaw Moment for different velocity

```
team0data_YM = Exp3data.YM(4:15);  % V = 0
team1data_YM = Exp3data.YM(17:28); % V = 100
team2data_YM = Exp3data.YM(29:40); % V = 150
team3data_YM = Exp3data.YM(41:52); % V = 175
team4data_YM = Exp3data.YM(53:64); % V = 200
team5data_YM = Exp3data.YM(65:76); % V = 220
```

Rolling Moment for different velocity

```
team0data_RM = Exp3data.RM(4:15);  % V = 0
team1data_RM = Exp3data.RM(17:28); % V = 100
team2data_RM = Exp3data.RM(29:40); % V = 150
team3data_RM = Exp3data.RM(41:52); % V = 175
team4data_RM = Exp3data.RM(53:64); % V = 200
team5data_RM = Exp3data.RM(65:76); % V = 220
```

AoA for different Teams

```
team0data_AoA = Exp3data.PitchAbs(4:15);  % V = 0
team1data_AoA = Exp3data.PitchAbs(17:28); % V = 100
team2data_AoA = Exp3data.PitchAbs(29:40); % V = 150
team3data_AoA = Exp3data.PitchAbs(41:52); % V = 175
team4data_AoA = Exp3data.PitchAbs(53:64); % V = 200
team5data_AoA = Exp3data.PitchAbs(65:76); % V = 220
```

Aerodynamic Force for different velocity (Maybe Chord force)

```
team0data_AF = Exp3data.AF(4:15);  % V = 0
team1data_AF = Exp3data.AF(17:28); % V = 100
team2data_AF = Exp3data.AF(29:40); % V = 150
team3data_AF = Exp3data.AF(41:52); % V = 175
```

```
team4data_AF = Exp3data.AF(53:64); % V = 200
team5data_AF = Exp3data.AF(65:76); % V = 220
```

Constants

```
S = 0.525; % [ ft^2 ]
c_bar = 0.58; % [ ft ]
b = 13.5; % [ in ]
W = 3.24 % [ lb ]
x = 2 % [ in ]
z = 0.625 % [ in ]
```

```
W =

    3.2400


x =

     2


z =

    0.6250
```

Dynamic Pressure for different velo.

```
V = [0 100 150 175 200 220];
rho_air = 2.378 * 10^-3 ; % [ slug /ft^3 ]

for i = 1:6

    q(i) = (1/2)*rho_air*V(i)^2;

end
```

Forces for Balance axis (UNCORRECTED)

```
% C_Nu = N / q*S [Normal Force]

team0_C_Nu = team0data_NF/(S*q(1));
team1_C_Nu = team1data_NF/(S*q(2)) - team0data_NF;
team2_C_Nu = team2data_NF/(S*q(3)) - team0data_NF;
team3_C_Nu = team3data_NF/(S*q(4)) - team0data_NF;
team4_C_Nu = team4data_NF/(S*q(5)) - team0data_NF;
team5_C_Nu = team5data_NF/(S*q(6)) - team0data_NF;

% C_cu = Cc / q*S   [Chord Force]
team0_C_cu = team0data_AF/(S*q(1));
```

```
team1_C_cu = team1data_AF/(S*q(2)) - team0data_AF;
team2_C_cu = team2data_AF/(S*q(3)) - team0data_AF;
team3_C_cu = team3data_AF/(S*q(4)) - team0data_AF;
team4_C_cu = team4data_AF/(S*q(5)) - team0data_AF;
team5_C_cu = team5data_AF/(S*q(6)) - team0data_AF;

%C_Yu = Y/q*S Side Force [Side Force]

team0_C_Yu = team0data_SF/(S*q(1));
team1_C_Yu = team1data_SF/(S*q(2)) - team0data_SF;
team2_C_Yu = team2data_SF/(S*q(3)) - team0data_SF;
team3_C_Yu = team3data_SF/(S*q(4)) - team0data_SF;
team4_C_Yu = team4data_SF/(S*q(5)) - team0data_SF;
team5_C_Yu = team5data_SF/(S*q(6)) - team0data_SF;

% C_PMu = PM / q*S*Cw [ Pitching Moment ]

team0_C_PMu = team0data_PM/(S*c_bar*q(1));
team1_C_PMu= team1data_PM/(S*c_bar*q(2)) - team0data_PM;
team2_C_PMu = team2data_PM/(S*c_bar*q(3)) - team0data_PM;
team3_C_PMu = team3data_PM/(S*c_bar*q(4)) - team0data_PM;
team4_C_PMu = team4data_PM/(S*c_bar*q(5)) - team0data_PM;
team5_C_PMu = team5data_PM/(S*c_bar*q(6)) - team0data_PM;

%C_YMu = YM/q*S*b [ Yawing Moment ]

team0_C_YMu = team0data_YM/(S*b*q(1));
team1_C_YMu= team1data_YM/(S*b*q(2)) - team0data_YM;
team2_C_YMu = team2data_YM/(S*b*q(3)) - team0data_YM;
team3_C_YMu = team3data_YM/(S*b*q(4)) - team0data_YM;
team4_C_YMu = team4data_YM/(S*b*q(5)) - team0data_YM;
team5_C_YMu = team5data_YM/(S*b*q(6)) - team0data_YM;

%C_lmu = RM/q*S*b [ Rolling Moment ]

team0_C_lmu = team0data_RM/(S*b*q(1));
team1_C_lmu= team1data_RM/(S*b*q(2)) - team0data_RM;
team2_C_lmu = team2data_RM/(S*b*q(3)) - team0data_RM;
team3_C_lmu = team3data_RM/(S*b*q(4)) - team0data_RM;
team4_C_lmu = team4data_RM/(S*b*q(5)) - team0data_RM;
team5_C_lmu = team5data_RM/(S*b*q(6)) - team0data_RM;
```

Corrected External balance Data

```
% Normal Force

team0_C_Nc = team0_C_Nu - 0.001*team0_C_Nu
team1_C_Nc = team1_C_Nu - 0.001*team1_C_Nu
team2_C_Nc = team2_C_Nu - 0.001*team2_C_Nu
team3_C_Nc = team3_C_Nu - 0.001*team3_C_Nu
team4_C_Nc = team4_C_Nu - 0.001*team4_C_Nu
team5_C_Nc = team5_C_Nu - 0.001*team5_C_Nu
```

```
% Chord Force
team0_C_cc = team0_C_cu - 0.01*team0_C_cu;
team1_C_cc = team1_C_cu - 0.01*team1_C_cu;
team2_C_cc = team2_C_cu - 0.01*team2_C_cu;
team3_C_cc = team3_C_cu - 0.01*team3_C_cu;
team4_C_cc = team4_C_cu - 0.01*team4_C_cu;
team5_C_cc = team5_C_cu - 0.01*team5_C_cu;

% team0_C_cc = team0_C_cu;
% team1_C_cc = team1_C_cu;
% team2_C_cc = team2_C_cu;
% team3_C_cc = team3_C_cu;
% team4_C_cc = team4_C_cu;
% team5_C_cc = team5_C_cu;

% Side Force

team0_C_Yc = team0_C_Yu;
team1_C_Yc = team1_C_Yu;
team2_C_Yc = team2_C_Yu;
team3_C_Yc = team3_C_Yu;
team4_C_Yc = team4_C_Yu;
team5_C_Yc = team5_C_Yu;

% Pitching Moment

team0_C_PMc = team0_C_PMu;
team1_C_PMc = team1_C_PMu;
team2_C_PMc = team2_C_PMu;
team3_C_PMc = team3_C_PMu;
team4_C_PMc = team4_C_PMu;
team5_C_PMc = team5_C_PMu;

% Yawing Moment
team0_C_YMc = team0_C_YMu;
team1_C_YMc = team1_C_YMu;
team2_C_YMc = team2_C_YMu;
team3_C_YMc = team3_C_YMu;
team4_C_YMc = team4_C_YMu;
team5_C_YMc = team5_C_YMu;

% Rolling Moment
team0_C_lmc = team0_C_lmu;
team1_C_lmc = team1_C_lmu;
team2_C_lmc = team2_C_lmu;
team3_C_lmc = team3_C_lmu;
team4_C_lmc = team4_C_lmu;
team5_C_lmc = team5_C_lmu;


team0_C_Nc =

   NaN
   NaN
```

```
   NaN
   NaN
   NaN
   NaN
   NaN
   NaN
   NaN
   NaN
   NaN
   NaN


team1_C_Nc =

   -0.1734
   -0.0513
    0.0675
    0.1964
    0.3034
    0.4193
    0.5360
    0.6248
    0.7359
    0.7892
    0.8222
    0.8893


team2_C_Nc =

   -0.1596
   -0.0450
    0.0669
    0.1888
    0.2858
    0.3961
    0.5050
    0.5882
    0.7003
    0.7580
    0.7930
    0.8363


team3_C_Nc =

   -0.1531
   -0.0395
    0.0661
    0.1857
    0.2831
    0.3939
    0.5020
    0.5825
```

```
    0.6988
    0.7440
    0.7924
    0.8293


team4_C_Nc =

   -0.1519
   -0.0402
    0.0668
    0.1825
    0.2783
    0.3859
    0.4940
    0.5781
    0.6838
    0.7309
    0.7621
    0.8032


team5_C_Nc =

   -0.1516
   -0.0401
    0.0642
    0.1821
    0.2776
    0.3894
    0.4952
    0.5773
    0.6829
    0.7358
    0.7718
    0.7619
```

Tramsfer to MAC

```
% Normal Force C_N_MAC = C_NC

team_0_N_MAC = team0_C_Nc ;
team_1_N_MAC = team1_C_Nc ;
team_2_N_MAC = team2_C_Nc ;
team_3_N_MAC = team3_C_Nc ;
team_4_N_MAC = team4_C_Nc ;
team_5_N_MAC = team5_C_Nc ;

% Chord Force C_Cc_MAC = C_Cc

team_0_Cc_MAC = team0_C_cc ;
team_1_Cc_MAC = team1_C_cc ;
```

```
team_2_Cc_MAC = team2_C_cc ;
team_3_Cc_MAC = team3_C_cc ;
team_4_Cc_MAC = team4_C_cc ;
team_5_Cc_MAC = team5_C_cc ;

% Side Force "Y" C_Y_mac = C_Yc
team_0_Y_MAC = team0_C_Yc ;
team_1_Y_MAC = team1_C_Yc ;
team_2_Y_MAC = team2_C_Yc ;
team_3_Y_MAC = team3_C_Yc ;
team_4_Y_MAC = team4_C_Yc ;
team_5_Y_MAC = team5_C_Yc ;

% Pitching Moment "PM" PM_MAC = C_MC*(x/c_bar) = C_cc*(z/c_bar)

team_0_PM_MAC = team0_C_PMc*(x/c_bar) - team0_C_cc*(z/c_bar);
team_1_PM_MAC = team1_C_PMc*(x/c_bar) - team1_C_cc*(z/c_bar);
team_2_PM_MAC = team2_C_PMc*(x/c_bar) - team2_C_cc*(z/c_bar);
team_3_PM_MAC = team3_C_PMc*(x/c_bar) - team3_C_cc*(z/c_bar);
team_4_PM_MAC = team4_C_PMc*(x/c_bar) - team4_C_cc*(z/c_bar);
team_5_PM_MAC = team5_C_PMc*(x/c_bar) - team5_C_cc*(z/c_bar);

% Yawing Moment "YM"  YM_MAC = C_YM_c = C_Y_c(x/b)
team_0_YM_MAC = team0_C_YMc - team0_C_Yc*(x/b);
team_1_YM_MAC = team1_C_YMc - team1_C_Yc*(x/b);
team_2_YM_MAC = team2_C_YMc - team2_C_Yc*(x/b);
team_3_YM_MAC = team3_C_YMc - team3_C_Yc*(x/b);
team_4_YM_MAC = team4_C_YMc - team4_C_Yc*(x/b);
team_5_YM_MAC = team5_C_YMc - team5_C_Yc*(x/b);

% Rolling moment (MAC) C_l_mac = C_lc - C_Y_c(z/S)

team_0_l_MAC = team0_C_lmc - team0_C_Yc*(z/S);
team_1_l_MAC = team1_C_lmc - team1_C_Yc*(z/S);
team_2_l_MAC = team2_C_lmc - team2_C_Yc*(z/S);
team_3_l_MAC = team3_C_lmc - team3_C_Yc*(z/S);
team_4_l_MAC = team4_C_lmc - team4_C_Yc*(z/S);
team_5_l_MAC = team5_C_lmc - team5_C_Yc*(z/S);
```

Stability axis data [sa]

```
AoA = [-4 -2 0 2 4 6 8 10 12 13 14 15]';

% Lift

for i = 1:12
    team_0_L_sa = team_0_N_MAC*cosd(AoA(i)) - team_0_Cc_MAC*sind(AoA(i));
end

for i = 1:12
    team_1_L_sa = team_1_N_MAC*cosd(AoA(i)) - team_1_Cc_MAC*sind(AoA(i));
end
```

```
for i = 1:12
    team_2_L_sa = team_2_N_MAC*cosd(AoA(i)) - team_2_Cc_MAC*sind(AoA(i));
end

for i = 1:12
    team_3_L_sa = team_3_N_MAC*cosd(AoA(i)) - team_3_Cc_MAC*sind(AoA(i));
end

for i = 1:12
    team_4_L_sa = team_4_N_MAC*cosd(AoA(i)) - team_4_Cc_MAC*sind(AoA(i));
end

for i = 1:12
    team_5_L_sa = team_5_N_MAC*cosd(AoA(i)) - team_5_Cc_MAC*sind(AoA(i));
end

% Drag

for i = 1:12
    team_0_D_sa = team_0_Cc_MAC*cosd(AoA(i)) + team_0_N_MAC*sind(AoA(i));
end

for i = 1:12
    team_1_D_sa = team_1_Cc_MAC*cosd(AoA(i)) + team_1_N_MAC*sind(AoA(i));
end

for i = 1:12
    team_2_D_sa = team_2_Cc_MAC*cosd(AoA(i)) + team_1_N_MAC*sind(AoA(i));
end

for i = 1:12
    team_3_D_sa = team_3_Cc_MAC*cosd(AoA(i)) + team_3_N_MAC*sind(AoA(i));
end

for i = 1:12
    team_4_D_sa = team_4_Cc_MAC*cosd(AoA(i)) + team_4_N_MAC*sind(AoA(i));
end

for i = 1:12
    team_5_D_sa = team_5_Cc_MAC*cosd(AoA(i)) + team_5_N_MAC*sind(AoA(i));
end

% Side force

team0_C_Y_sa = team_0_Y_MAC;
team1_C_Y_sa = team_1_Y_MAC;
team2_C_Y_sa = team_2_Y_MAC;
team3_C_Y_sa = team_3_Y_MAC;
team4_C_Y_sa = team_4_Y_MAC;
team5_C_Y_sa = team_5_Y_MAC;

% Pitching Moment

team0_C_PM_sa = team_0_PM_MAC;
```

```
team1_C_PM_sa = team_1_PM_MAC;
team2_C_PM_sa = team_2_PM_MAC;
team3_C_PM_sa = team_3_PM_MAC;
team4_C_PM_sa = team_4_PM_MAC;
team5_C_PM_sa = team_5_PM_MAC;

% Yawing moment

for i = 1:12
team0_C_YM_sa = team_0_YM_MAC*cosd(AoA(i)) - team_0_l_MAC*sind(AoA(i));
end

for i = 1:12
team1_C_YM_sa = team_1_YM_MAC*cosd(AoA(i)) - team_1_l_MAC*sind(AoA(i));
end

for i = 1:12
team2_C_YM_sa = team_2_YM_MAC*cosd(AoA(i)) - team_2_l_MAC*sind(AoA(i));
end

for i = 1:12
team3_C_YM_sa = team_3_YM_MAC*cosd(AoA(i)) - team_3_l_MAC*sind(AoA(i));
end

for i = 1:12
team4_C_YM_sa = team_4_YM_MAC*cosd(AoA(i)) - team_4_l_MAC*sind(AoA(i));
end

for i = 1:12
team5_C_YM_sa = team_5_YM_MAC*cosd(AoA(i)) - team_5_l_MAC*sind(AoA(i));
end

% Rolling moment

for i = 1:12
team0_C_RM_sa = team_0_l_MAC*cosd(AoA(i)) + team_0_YM_MAC*sind(AoA(i));
end

for i = 1:12
team1_C_RM_sa = team_1_l_MAC*cosd(AoA(i)) + team_1_YM_MAC*sind(AoA(i));
end

for i = 1:12
team2_C_RM_sa = team_2_l_MAC*cosd(AoA(i)) + team_2_YM_MAC*sind(AoA(i));
end

for i = 1:12
team3_C_RM_sa = team_3_l_MAC*cosd(AoA(i)) + team_3_YM_MAC*sind(AoA(i));
end

for i = 1:12
team4_C_RM_sa = team_4_l_MAC*cosd(AoA(i)) + team_4_YM_MAC*sind(AoA(i));
end
```

```
for i = 1:12
team5_C_RM_sa = team_5_l_MAC*cosd(AoA(i)) + team_5_YM_MAC*sind(AoA(i));
end
```

PLOTS

```
AoA = [-4 -2 0 2 4 6 8 10 12 13 14 15]';

% BALANCE AXIS PLOTS

%~~~~~~~~~~~~~~~~~ C_N ~~~~~~~~~~~~~~%

figure(1)
plot(AoA, team1_C_Nc, 'LineWidth', 1);
hold on
plot(AoA, team2_C_Nc, 'LineWidth', 1);
plot(AoA, team3_C_Nc, 'LineWidth', 1);
plot(AoA, team4_C_Nc, 'LineWidth', 1);
plot(AoA, team5_C_Nc, 'LineWidth', 1);
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('C_N')
title('C_N vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off

%~~~~~~~~~~~~~~~~~ C_c ~~~~~~~~~~~%

figure(2)
plot(AoA, team1_C_cc, 'LineWidth', 1);
hold on
plot(AoA, team2_C_cc, 'LineWidth', 1);
plot(AoA, team3_C_cc, 'LineWidth', 1);
plot(AoA, team4_C_cc, 'LineWidth', 1);
plot(AoA, team5_C_cc, 'LineWidth', 1);
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('C_c')
title('C_c vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off

%~~~~~~~~~~~~~~~~~ C_PM ~~~~~~~~~~~%

figure(3)
plot(AoA, team1_C_PMc, 'LineWidth', 1);
hold on
plot(AoA, team2_C_PMc, 'LineWidth', 1);
plot(AoA, team3_C_PMc, 'LineWidth', 1);
plot(AoA, team4_C_PMc, 'LineWidth', 1);
plot(AoA, team5_C_PMc, 'LineWidth', 1);
```

```
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('$C_{PM}$','Interpreter', 'latex')
title('C_{PM} vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off

% Stability Axis Plots

%~~~~~~~~~~~~~~~~~ C_L ~~~~~~~~~~~~~~%

figure(4)
plot(AoA,  team_1_L_sa, 'LineWidth', 1);
hold on
plot(AoA, team_2_L_sa, 'LineWidth', 1);
plot(AoA, team_3_L_sa, 'LineWidth', 1);
plot(AoA, team_4_L_sa, 'LineWidth', 1);
plot(AoA, team_5_L_sa, 'LineWidth', 1);
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('C_L')
title('C_L vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off

%~~~~~~~~~~~~~~~~~ C_D ~~~~~~~~~~~%

figure(5)
plot(AoA, team_1_D_sa, 'LineWidth', 1);
hold on
plot(AoA, team_2_D_sa, 'LineWidth', 1);
plot(AoA, team_3_D_sa, 'LineWidth', 1);
plot(AoA, team_4_D_sa, 'LineWidth', 1);
plot(AoA, team_5_D_sa, 'LineWidth', 1);
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('C_D')
title('C_D vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off

%~~~~~~~~~~~~~~~~~ C_PM ~~~~~~~~~~~%

figure(6)
plot(AoA, team1_C_PM_sa, 'LineWidth', 1);
hold on
plot(AoA, team2_C_PM_sa, 'LineWidth', 1);
plot(AoA, team3_C_PM_sa, 'LineWidth', 1);
plot(AoA, team4_C_PM_sa, 'LineWidth', 1);
plot(AoA, team5_C_PM_sa, 'LineWidth', 1);
legend('Team 1, V = 100 ft/s', 'Team 2, V = 150 ft/s', 'Team 3, V = 175
```

```
ft/s', 'Team 4, V = 200 ft/s', 'Team 5, V = 220 ft/s', 'Location', 'best');
xlabel('AoA (\alpha)')
ylabel('$C_{PM}$','Interpreter', 'latex')
title('C_{PM} vs AoA (\alpha) [STABILITY AXIS]')
grid on
hold off
```

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