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Wind Tunnel Lab %%%

```
clear;close all;clc;
R_air = 287.058; %J/(kg*K)
voltage = 0.5:0.5:10;
```

Calculating Velocity with Pitot

```
for i=1:12
    files_PP = dir('VelocityVoltageData/
PitotProbeToPressureTransducer/');
    PP(:,:,i) = load(strcat(files_PP(i+2).folder,'/',files_PP(i
+2).name));

    for j=1:5
        p_atm = PP(:,1,i);
        p_atm = mean(p_atm((j-1)*500+1:j*500));
        T_atm = PP(:,2,i);
        T_atm = mean(T_atm((j-1)*500+1:j*500));
        del_p = PP(:,3,i);
        del_p = mean(del_p((j-1)*500+1:j*500));
        airspeed_PP(j,i) = sqrt(2*del_p*R_air*T_atm/p_atm);
        voltage_PP(j,i) = PP(j*500,7,i);
    end
end

temp_airspeed_PP = [];
temp_voltage_PP = [];
for i=1:4
    temp_airspeed_PP =
 [temp_airspeed_PP,mean([airspeed_PP(:,i),airspeed_PP(:,i
+4),airspeed_PP(:,i+8)].')];
    temp_voltage_PP =
 [temp_voltage_PP,mean([voltage_PP(:,i),voltage_PP(:,i
+4),voltage_PP(:,i+8)].')];
end
```

Calculating Velocity with Venturi

```
area_ratio = 1/9.5;
```

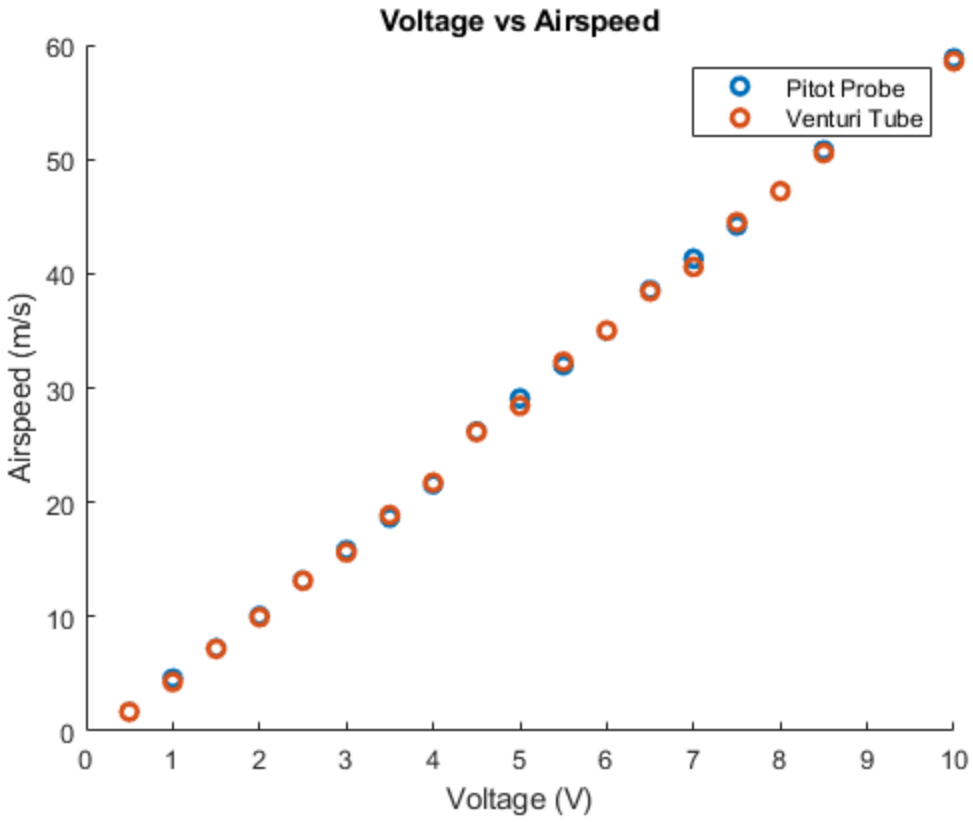
```
for i=1:12
    files_VT = dir('VelocityVoltageData/
VenturiTubeToPressureTransducer/');
    VT(:,:,i) = load(strcat(files_VT(i+2).folder,'/',files_VT(i
+2).name));

    for j=1:5
        p_atm = VT(:,1,i);
        p_atm = mean(p_atm((j-1)*500+1:j*500));
        T_atm = VT(:,2,i);
        T_atm = mean(T_atm((j-1)*500+1:j*500));
        del_p = VT(:,3,i);
        del_p = mean(del_p((j-1)*500+1:j*500));
        airspeed_VT(j,i) = sqrt(2*del_p*R_air*T_atm/(p_atm.*(1-
area_ratio.^2)));
        voltage_VT(j,i) = VT(j*500,7,i);
    end
end

temp_airspeed_VT = [];
temp_voltage_VT = [];
for i=1:4
    temp_airspeed_VT =
 [temp_airspeed_VT,mean([airspeed_VT(:,i),airspeed_VT(:,i
+4),airspeed_VT(:,i+8)].')];
    temp_voltage_VT =
 [temp_voltage_VT,mean([voltage_VT(:,i),voltage_VT(:,i
+4),voltage_VT(:,i+8)].')];
end
```

Plot Result

```
hold on;
title("Voltage vs Airspeed");
xlabel("Voltage (V)");
ylabel("Airspeed (m/s)");
scatter(temp_voltage_PP,temp_airspeed_PP,"LineWidth",2);
scatter(temp_voltage_VT,temp_airspeed_VT,"LineWidth",2);
legend("Pitot Probe","Venturi Tube");
hold off;
```



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