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Roshan Jaiswal-Ferri

```
%Aero 452 Homework 1: 9/24/25
```

Workspace Prep

```
format long      %Allows for more accurate decimals
close all;       %Clears all
clear all;       %Clears Workspace
clc;             %Clears Command Window
```

Delta V inert vs Finert

```
g = 9.8;
ISPc = 60; %seconds
ISPch = 320;
ISPn = 950;
ISPe = 3000;

ISP = [ISPc, ISPch, ISPn, ISPe];
finert = linspace(0,1,50);
denom = log(1./finert) * g;

for i = 1:4
    dV(i,:) = ISP(i).*denom;
end
```

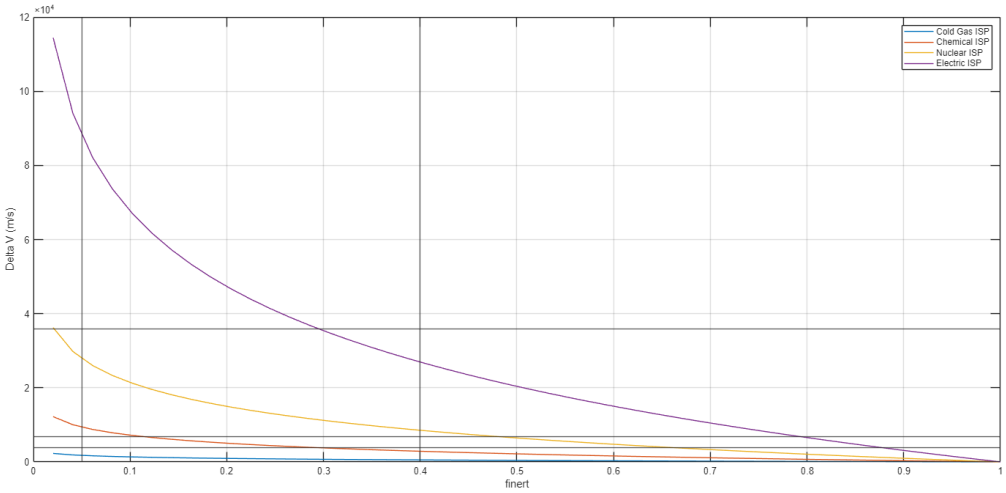
Feasabilty

```
% The graph shows feasability of finert vs dv, where any space above each
% line is not feasable (or to the left of the xline at 0.05). Each yline
% represents the dv requirement for each mission, as long as there is space
% under each finert dv line and above the xline, and to the right of the
% 0.05 line, then that option is feasable (except for part b which requires
% a finert of 0.4). Given that, here are the results:

% a) All options are feasable
% b) Only nuclear and electric systems are feasable
% c) Chemical, Nuclear, & Electric systems are all feasable
% d) Only electric is feasable
```

```
figure('Name','DeltaV vs Finert')
plot(finert,dV)
grid on
xline(0.05)
xline(0.4)
yline(50)
yline(3940)
yline(6790)
yline(35880)
xlabel('finert')
ylabel('Delta V (m/s)')
legend('Cold Gas ISP', 'Chemical ISP', 'Nuclear ISP', 'Electric ISP')

% The shape of this graph makes sense, it is saying for each option the
% more propellant to inert mass you have, the more delta v capable the
% system is. As the inert mass increases the delta v drops. The more
% efficient systems get more delta v out of their mass ratios.
```



Published with MATLAB® R2024b