

## AERO 3220 Spring 26

### Addendum to Atmosphere Model

Our missile and/or target may fly trajectories at altitudes > 11 km. MSL. The stratosphere begins at 11 km. MSL.

A modification to our atmosphere model is needed. Here it is:

%% Stratosphere starts at 11 km.

```
    if z > 11000
```

```
        T = T0 + lapseRate*(11000-z0); %Temp=constant
```

```
        P11k = P0*(T/T0)^(-g/(lapseRate*R));
```

```
        P = P11k*exp(-g*(z-11000)/(R*T));
```

```
        rho = P/(R*T);
```

```
        acousticSpeed = sqrt(gamma*R*T);
```

```
    end
```

z = altitude MSL

z0 = altitude where P0 and T0 are measured. This is usually 0 or MSL.

You already have g, lapseRate, R and gamma in the basic model.

Note that 11000-z0 = constant, so T = constant for z >= 11 km. MSL.