

**Input Parameters**

**COMBUSTION EFFICIENCY, (C\*/C\*ideal)**

**(O/F) Mixture Ratio**

**Combustor Pressure, kPa**

**Throat Diameter, cm**

**A/A\*exit**

**Nozzle Length, cm**

**Exit Angle, deg**

**Ambient Pressure, kPa**

**GOX/ABS CEA Output Data**

**T0, actual, deg K**  **MW**  **Cp, J/lg-degK**

**Gamma**  **Rg, J/kg-degK**

**Isentropic Nozzle Convergence Properties**

**Starting Mach**   
**Max # iterations**   
**% error in (A/A\*)**

**Exit Properties**

**M(exit)**   
**v(Exit), deg**   
**Theta Max, deg**   
**(2/3)\*Theta Max, deg 2**   
**Minimum Conical Length, cm**   
**Chosen Length, cm**   
**Rcm expansion, cm**   
**Rcm contraction, cm 2**

**Isentropic Nozzle Output parameters**

**Exit mach Number**   
**Pexit, kPa**   
**Texit, deg. K**   
**Vexit, m/sec**   
**Mdot, kg/sec**   
**Thrust, kNt**   
**Isp, sec**   
**Exit Area, M^2**   
**Cstar, m/sec**   
**Max Isp, sec**   
**Max Thrust, Kn**   
**Ce, m/sec**   
**Isp Vac, sec**   
**A\*, M^2**

**Equivalent Altitude, km**

**Equivalent Altitude, ft**

**Shock Wave Location**

**Xat Shock Point, cm**

**Upstream Mach at Shock Point**

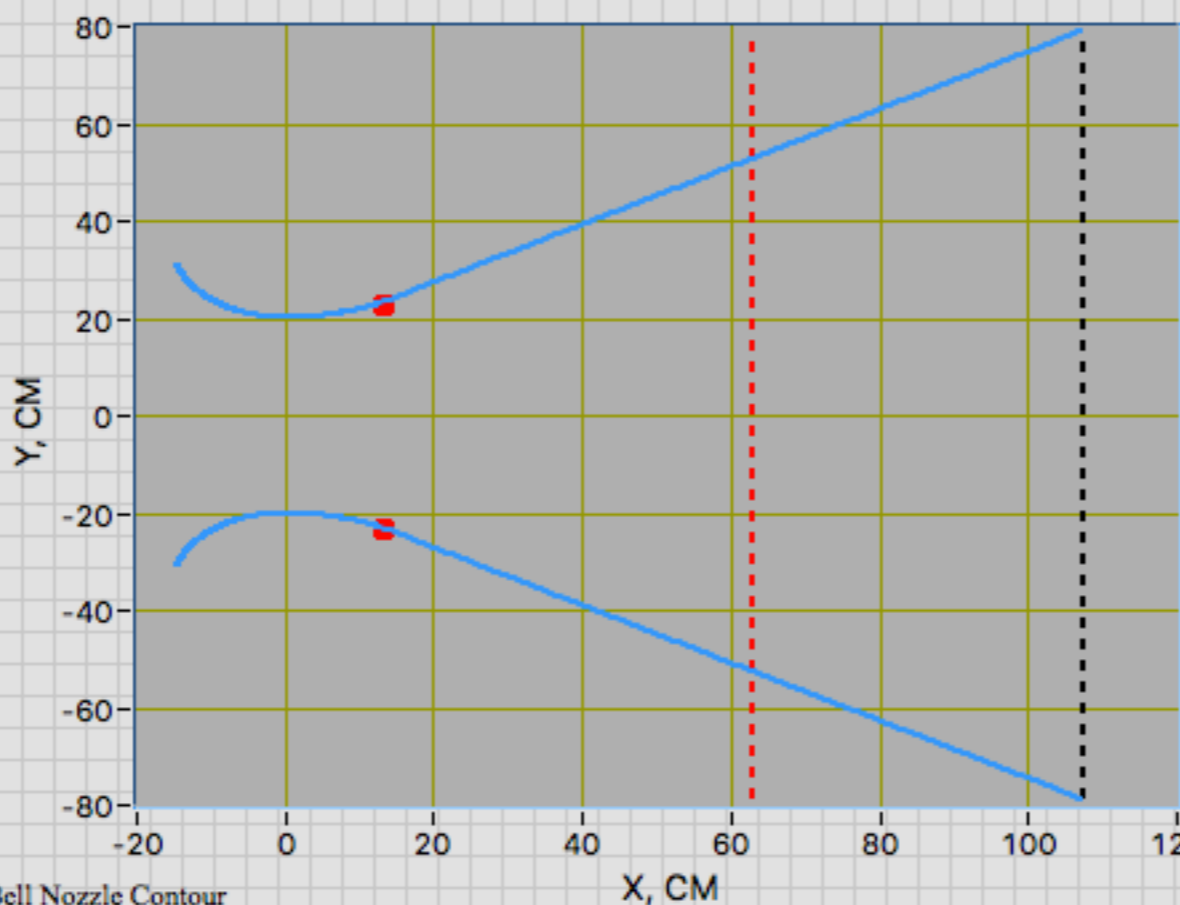
**Downstream Mach at Shock Point 2**

**Downstream P0 at Shock Point, kPa**

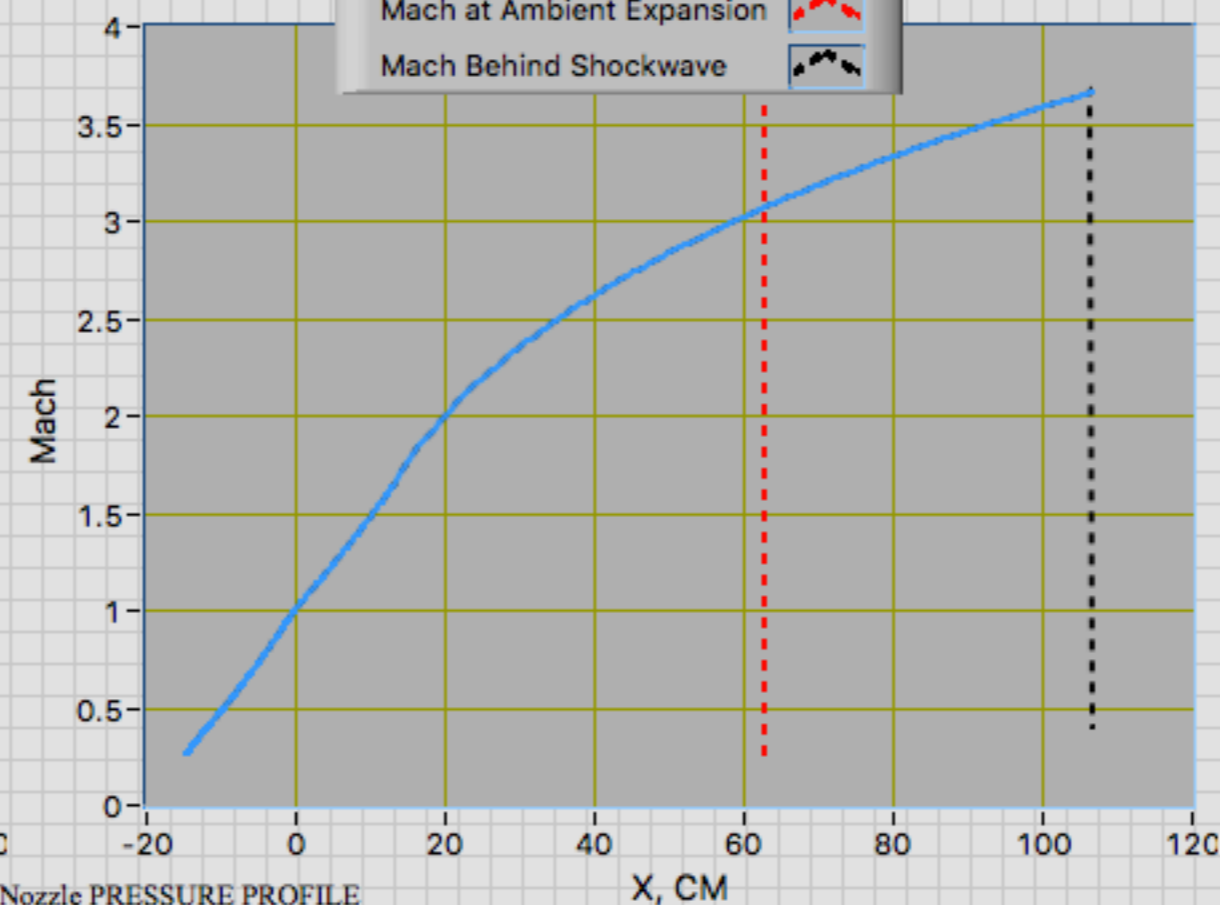
**Downstream A\*Shock Point, cm^2**

**Downstream Pstatic @ shock point, kPa**

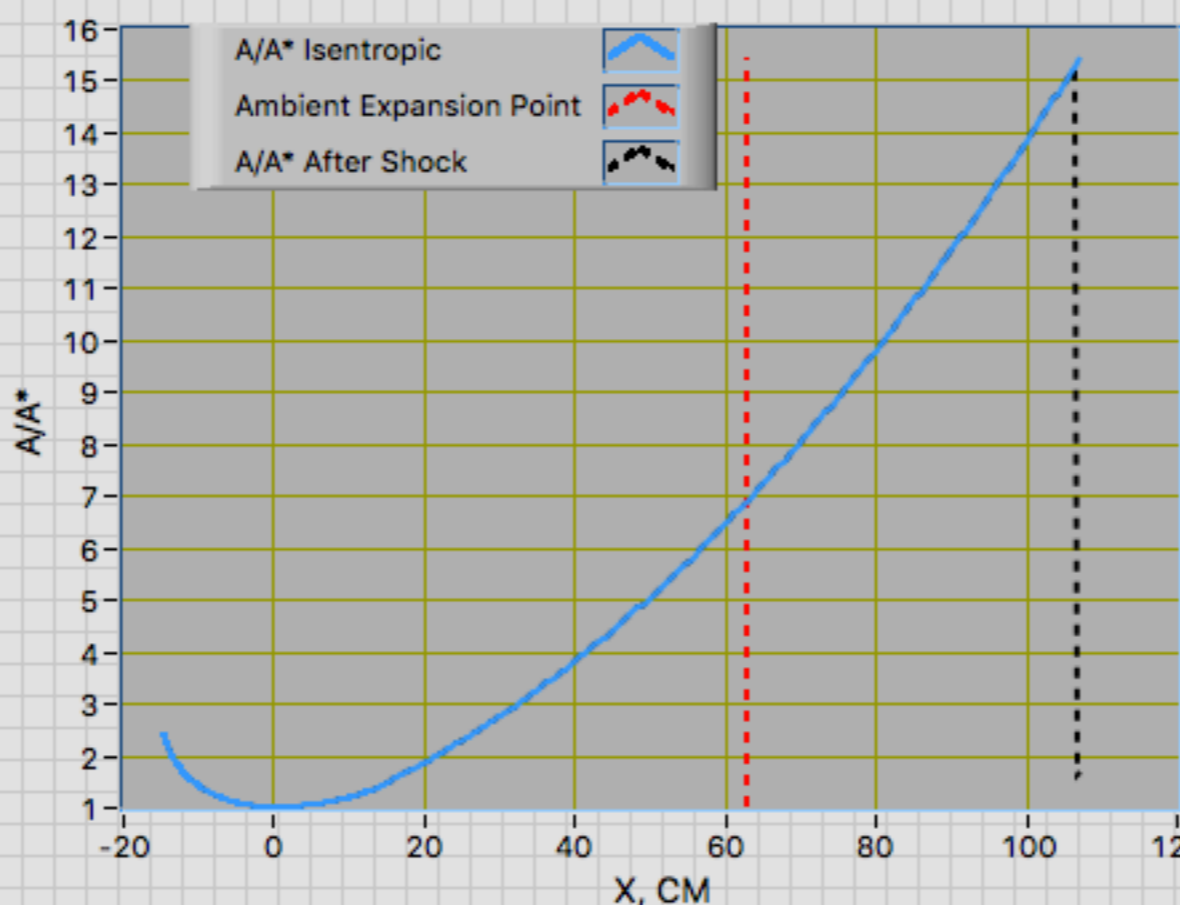
**Bell Nozzle Contour**



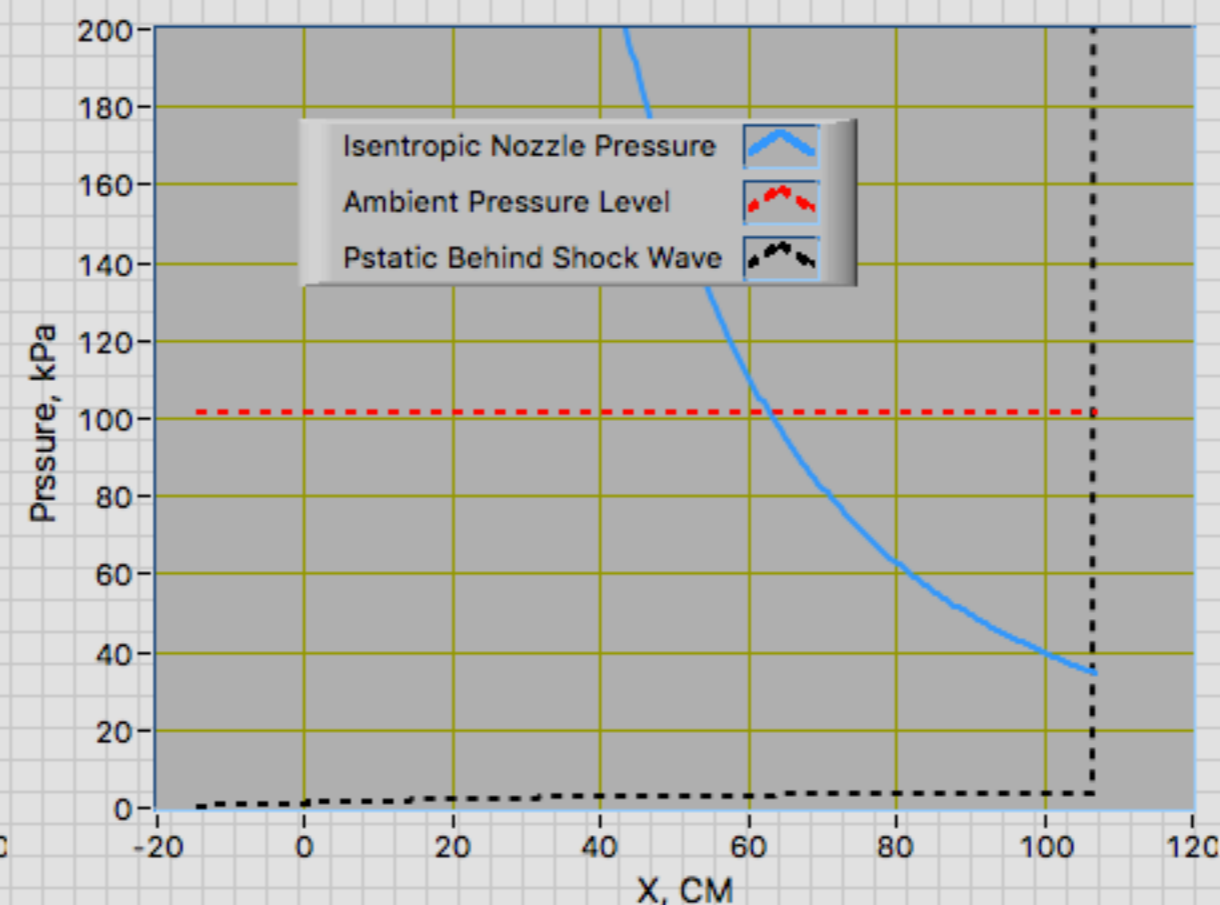
**Mach Number Profile**



**Bell Nozzle Contour**



**Nozzle PRESSURE PROFILE**



**Nozzle Temperature Profile**

