



Nozzle Design

NASA
Propulsion Academy
Marshall Space Flight Center
Huntsville, AL

Isaac Detrinidad (Team Leader), Juan Cruz, Ty Morton, Carrie Simmons

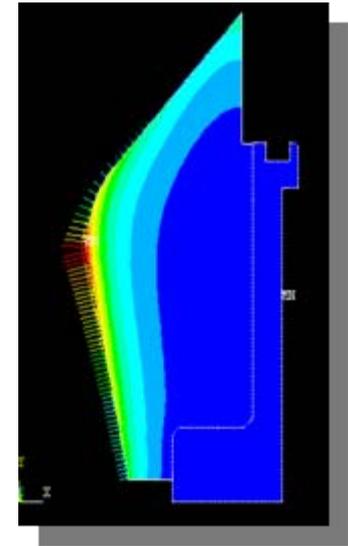
Background

- ATJ graphite nozzle
- ATPC motors
- Cracking of lip area



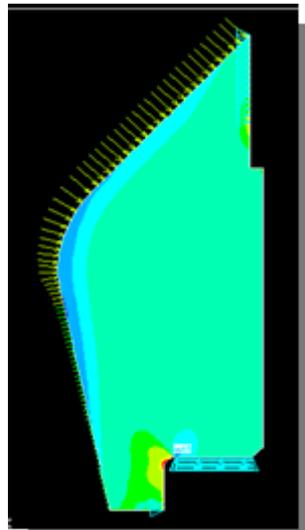
Methodology

- Isentropic Flow
- ANSYS-apply loads
 - Thermal
 - Structural
 - Pressure
- Alternative designs
- Visual inspection



Objective(s)

- Determine reasons for cracking
- New no-crack nozzle design
- Universal nozzle fit for housings



Acknowledgements

- Stan Tieman (Mentor)
 - ER 50
- Philip Franklin(Mentor)
 - ER 50
- Brent Coleman(Structural)
- Graham Nelson(Thermal)
- WDI (Army)
 - Christi Dolbeer