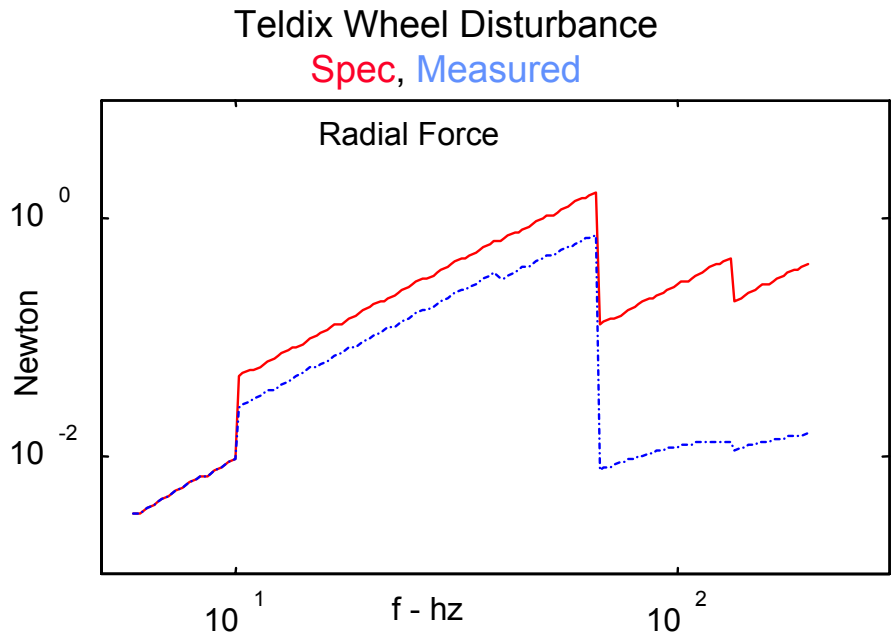
Observatory Configuration Backup Charts

Reaction Wheel Disturbance

TRW

- Teldix Statistical Disturbance Model
  - Radial Force: h(1) ~ 0.25e-3 N/rps2 ; h(.58) ~ .04e-3 N/rps2
  - Axial Force: h(4.86)~ 0.13e-3 N/rps2 ; h(7.12) ~ .6e-3 N/rps2



Scaling from 16-meter SBL

TRW

- 18 panels, 6” thick sandwich, 48 mil facesheets, 15 kg/m2, very stiff latches
- Active damping on SMSS support struts, 0.25% damping elsewhere
- Passive isolation
- Response due to random laser disturbance 0.5-50 Hz
- Disturbance is primarily a flat PSD applied on the S/C bus:
  - 66 N radial, 38 N axial: average in 3 directions = 57 Newton rms
- Found that mass scales as 1/Diameter^4 and frequency as 1/Diameter^2

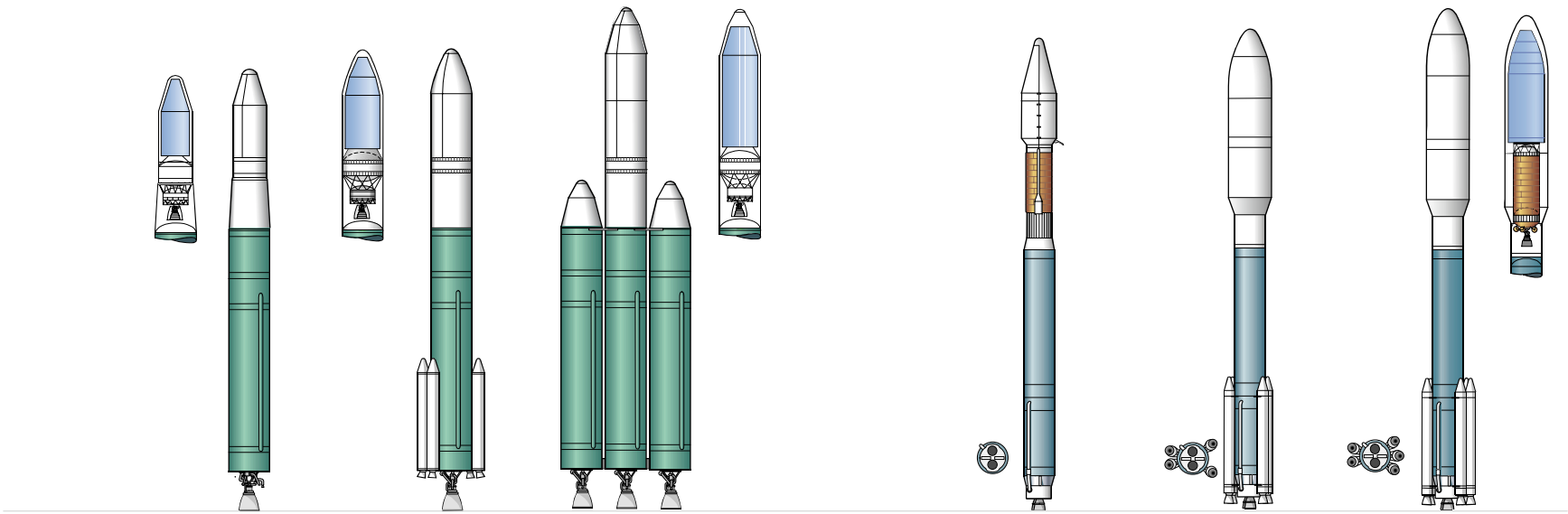
Performance Metrics for SBL subjected to Random Disturbance at S/C

Case	Configuration	Figure Error n-m/N	Spot Error n-Rad/N	LOS Error n-Rad/N
A	3 PM struts 2m below, 1Hz iso	77	54	218
B	6 PM struts 2m below, 1Hz iso	24	21	193
D	24 PM struts 2m below, 1Hz iso	8.4	5.4	186
E	24 PM struts 4m below, 1Hz iso	3.2	2.5	188
F	24 PM struts 4m below, 0.5 Hz rocking, 1Hz bounce iso	2.1	1.7	663

Launch System Trade Evaluates Cost/Risk In Orbit Delivery Alternatives

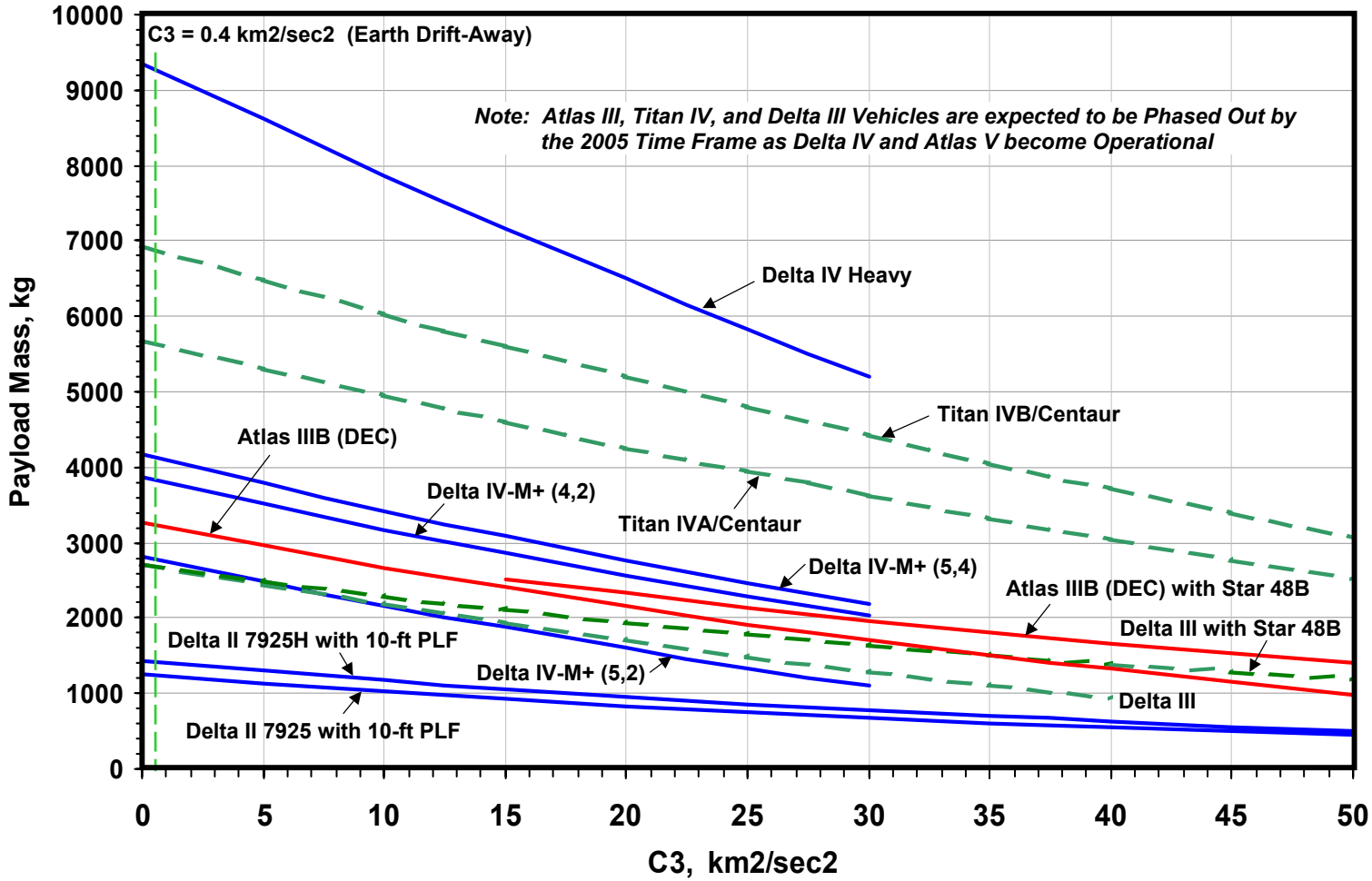
TRW

- Will document metrics for different delivery philosophies
  - Single launch
  - Multiple launches
  - On orbit assembly
- TRW has participated in defining performance characteristics of new vehicles for 40 years to best support our customers
  - Are on top of launch capabilities for 2011 timeframe



Launch Capability Estimates Enable Proper Delivery Cost/Plan

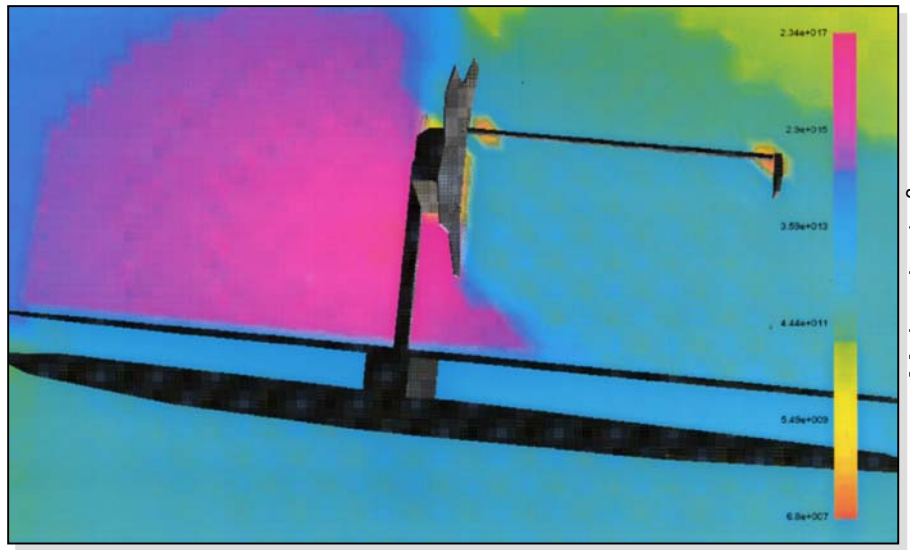
TRW



Plume Interactions / Contamination

TRW

- Plume interactions trade [on formation flyers]
  - Estimate inter-vehicle coupling
    - Thermal, dynamic (control loops etc), contamination...
  - Evaluate thruster options
    - Thruster orientation and fuel loading
    - Thruster/fuel types (electric, solid-state…)
  - Evaluate/develop control loop concepts
    - JPL's AFF sensor, TRW's work on NASA's Orbital Maneuvering Vehicle



Sample TPF Flow Field

- Tools: TRW Environmental Work Bench, MOLFLUX and TRW's Conflux, Contam III, TRW Particle Tracking Program