

AIAA SCI-TECH 2014

1st Sonic Boom Prediction Workshop

Modified Linear Theory

January 11, 2014

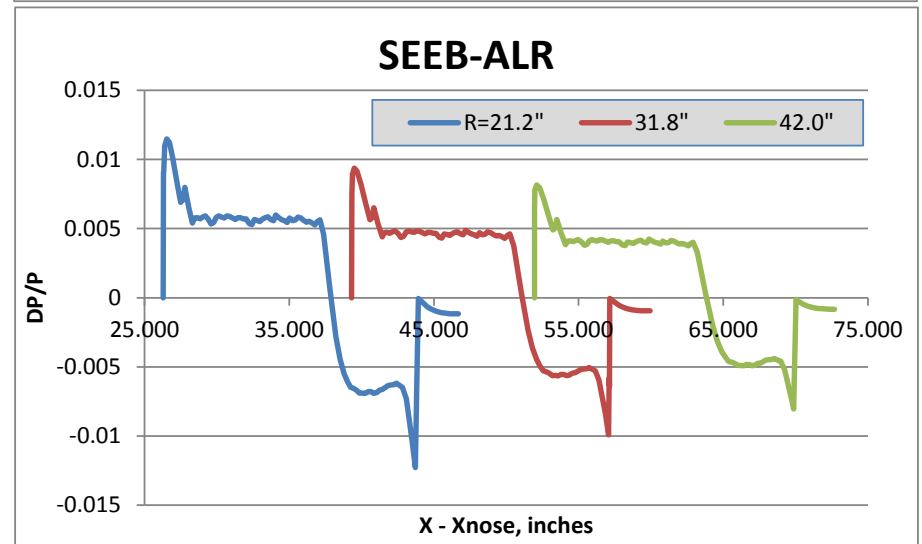
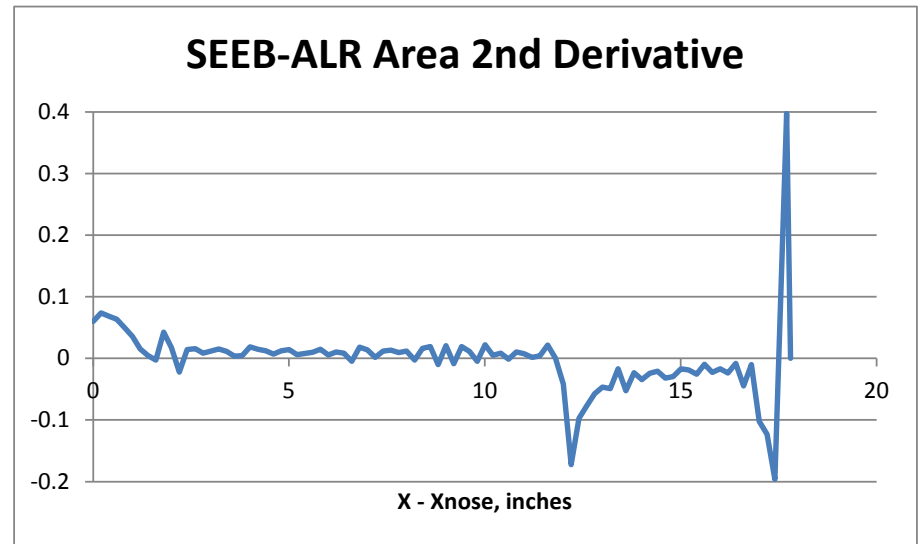
John Morgenstern





Modified Linear Theory

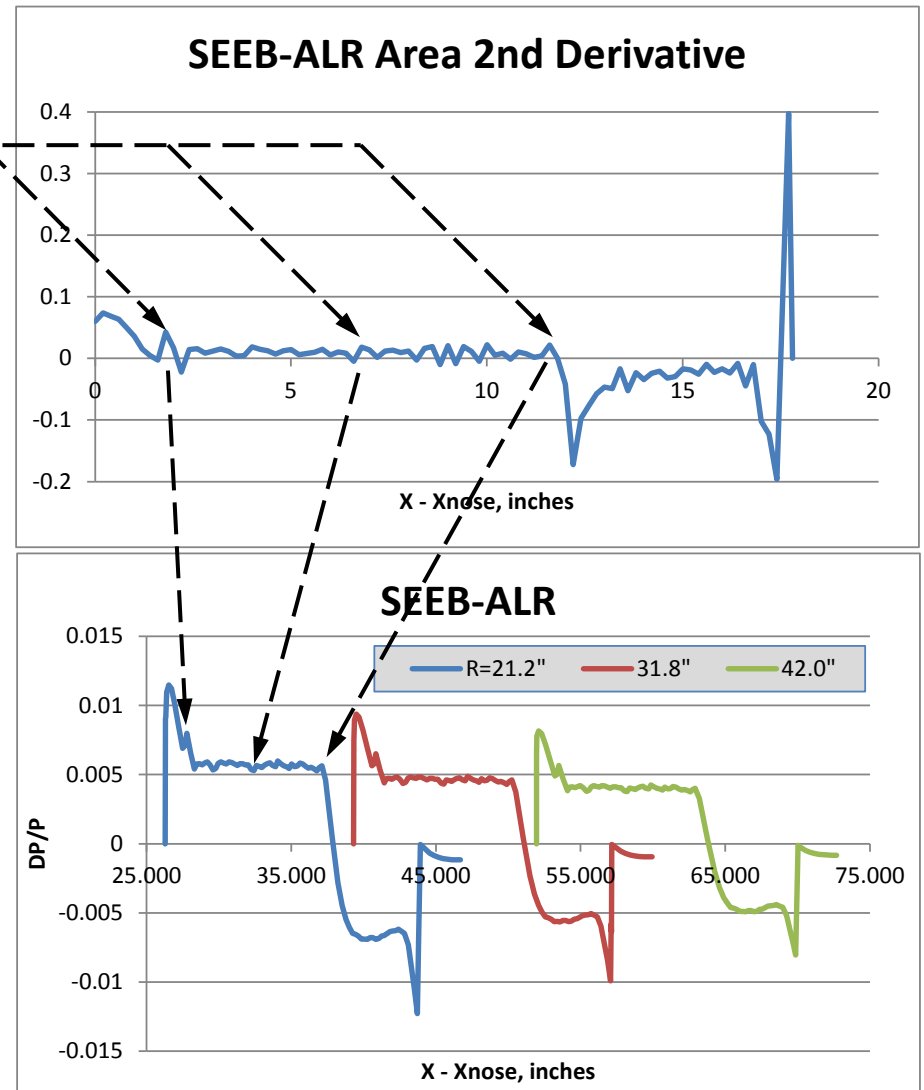
- 2 Types of Linear Theory Used
 - Far-Field (Mach-angle cut area equivalent body)
 - Near-Field (direct singularities)
- Linear Theory Modified with Aging Good Approximation for Axi-Body and W-B cases
- No Volume Grid or Dissipation
 - Exact correspondence between area definition and signature
 - 69deg WB measurements & linear indicate expansion anomaly following front shock – but different shape



SEEB-ALR



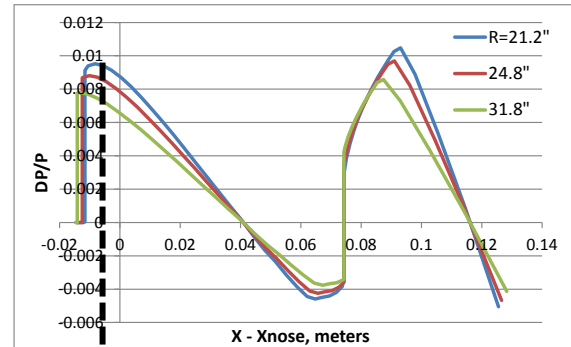
- Three Biggest “As-Built” Fabrication Differences Identified in Geometry and in Linear Signature Prediction



NASA 69deg Delta Wing-Body



Linear predicts rounded reduced expansion following front shock



Measurements indicate reduced expansion after initially strong expansion

