



ITA & Embraer contribution in joint DPW-8 & AEPW-4

Dr. Angelo Verri - EMBRAER

AIAA Aviation
June 2026, San Diego CA

Summary

- Introduce the working team
- CRM Static Deflections
- CRM Jig-shape
- Plenary reminder

Team

DPW – Static Deformation



Flávio L. S. Bussamra
Academic Advisor



Withor F. C. Menezes
Student / Materials Engineer



Angelo Antonio Verri
Industrial Advisor



Bruno Kronbauer de Oliveira
Student / Structures Engineer



DPW – Other WG



**MAURO
LOPEZ**



**EDUARDO
MOLINA**



**MURILO
MESTRINER**



JOÃO PEREZ COSTA



PEDRO SECCHI



**ARTHUR G.
BARBOSA**



**HENRIQUE S.
SCHLEETZ**

CRM STATIC DEFFLECTIONS

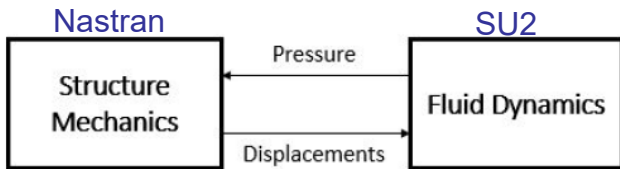


Fig. 1 - Loosely coupled FSI

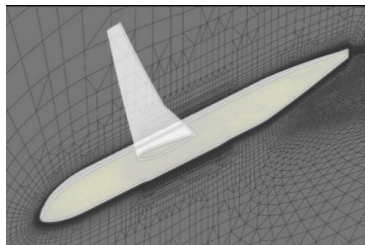


Fig. 2 – CFD Mesh L2 Helden



4

Fig. 3 – FEM solid mesh

- Proprietary coupling with 3D loads calculation and aerodynamic mesh morphing.
- CFD: RANS, SA, QCR correction.
- Nastran: linear static structural solution.
- Sweeps Mach 0.7, 0.85 e Reynolds 5M, 19.8M e 30M.
- Presentation Thursday 2PM. SU2-Nastran Framework for Transonic Static Aeroelastic Deflections.

CRUISE RESULTS - Case 2a(E)

- Predictions and tests well correlated

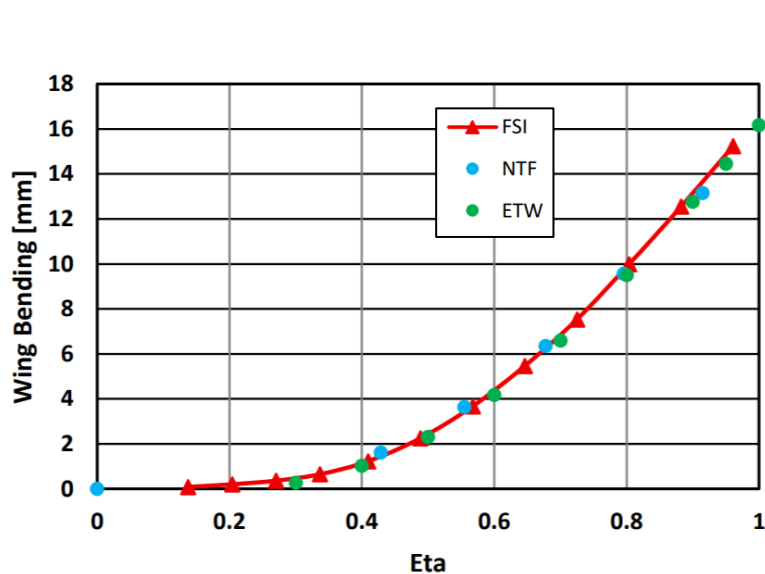


Fig. 4 – Spanwise deflections
Re 5M, Mach 0.85, CL 0.5

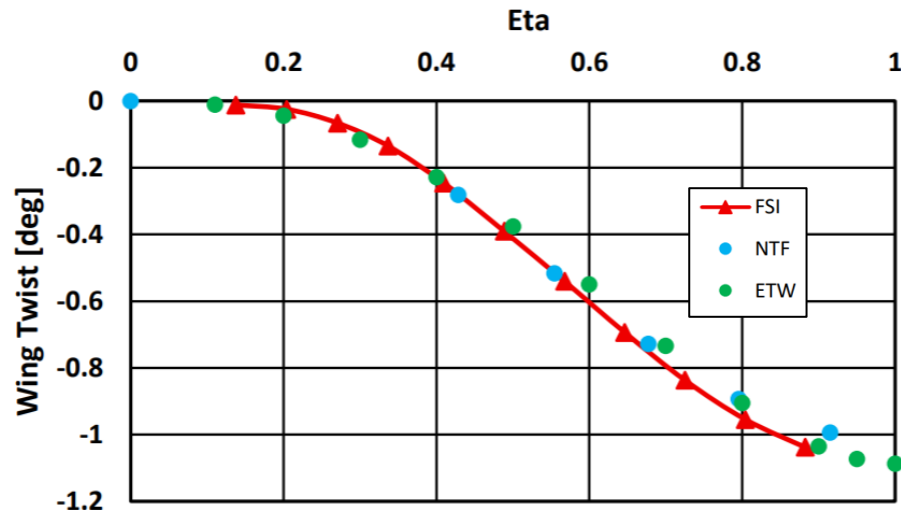
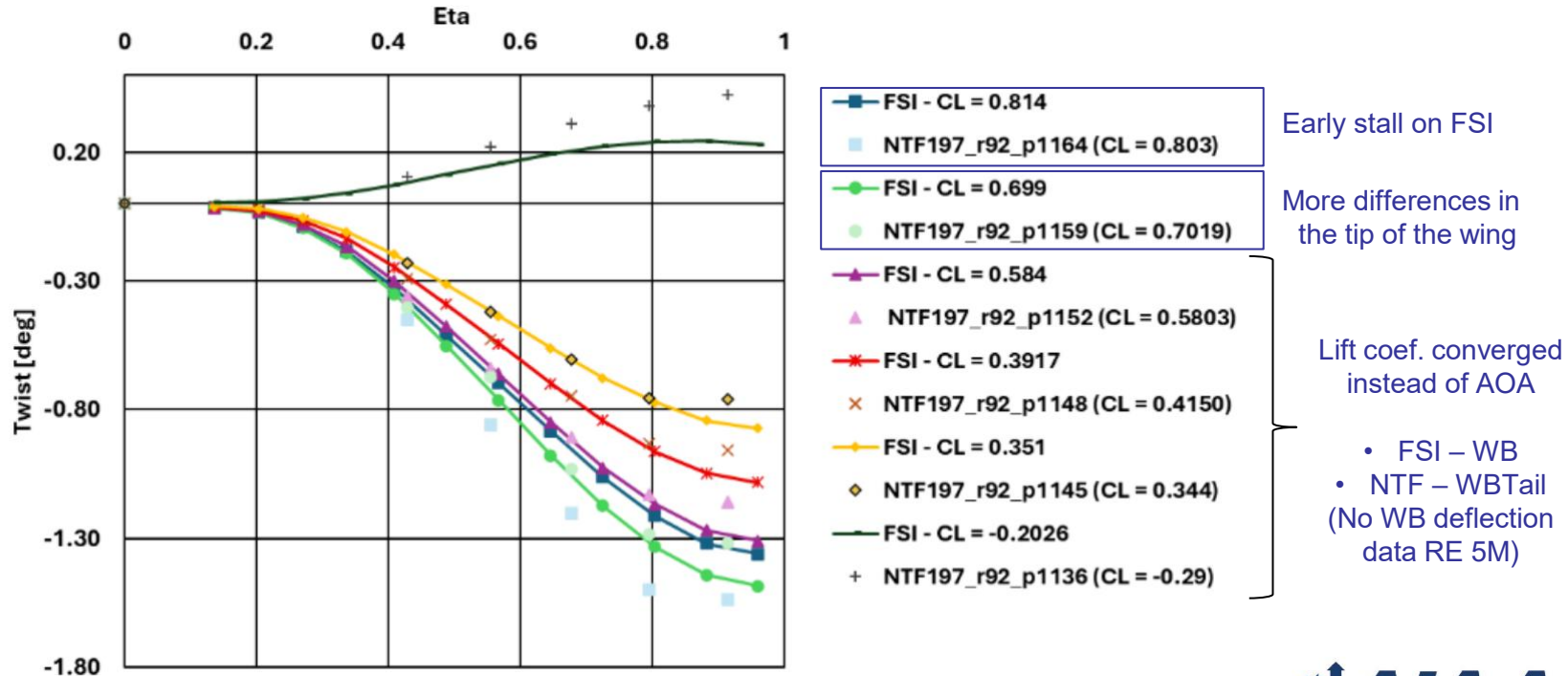


Fig. 5 – Spanwise torsion
Re 5M, Mach 0.85, CL 0.5

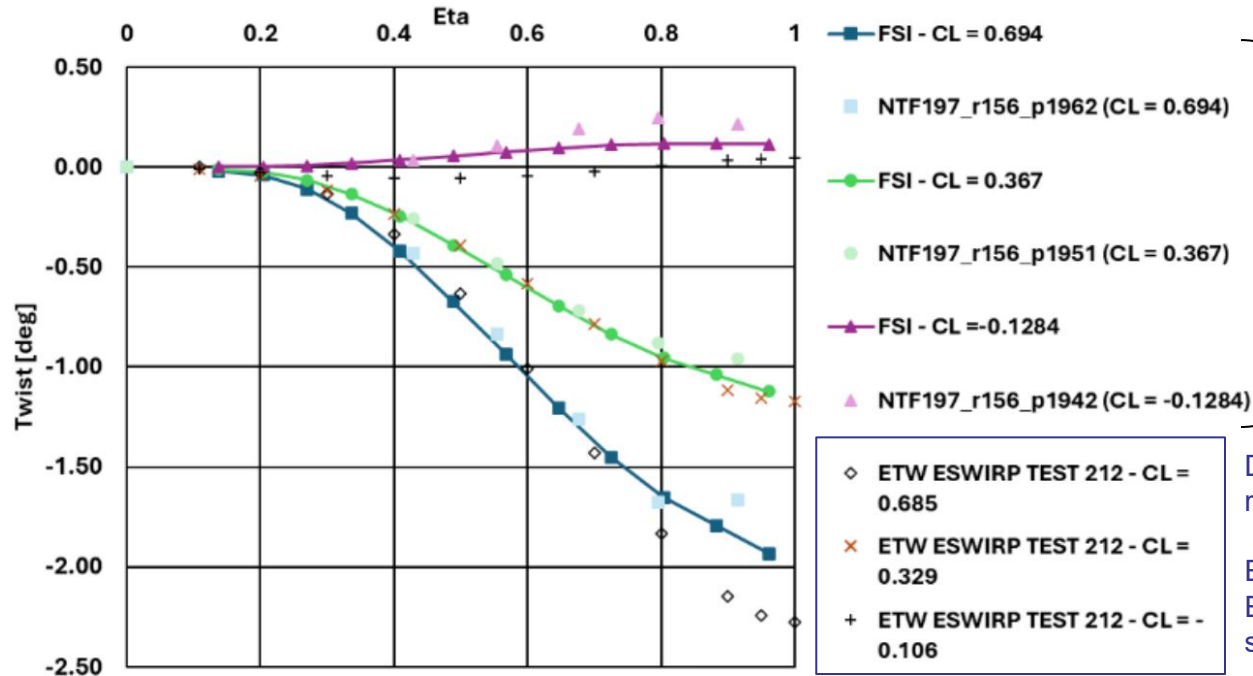
SWEEP MACH 0.85 and RE 5M – Case 2b(E)

- Global well prediction, with tip needing attention



SWEEP MACH 0.85 and RE 19.8M

- Predictions are within the NTF and ETW experiments



NTF – WB (available)
FSI – WB
ETW – WB Tail
(closest condition)

Differences on tip
result (NTF vs ETW)

Effect with mesh?
Effect with full test
section modeled?

CRM JIG SHAPE

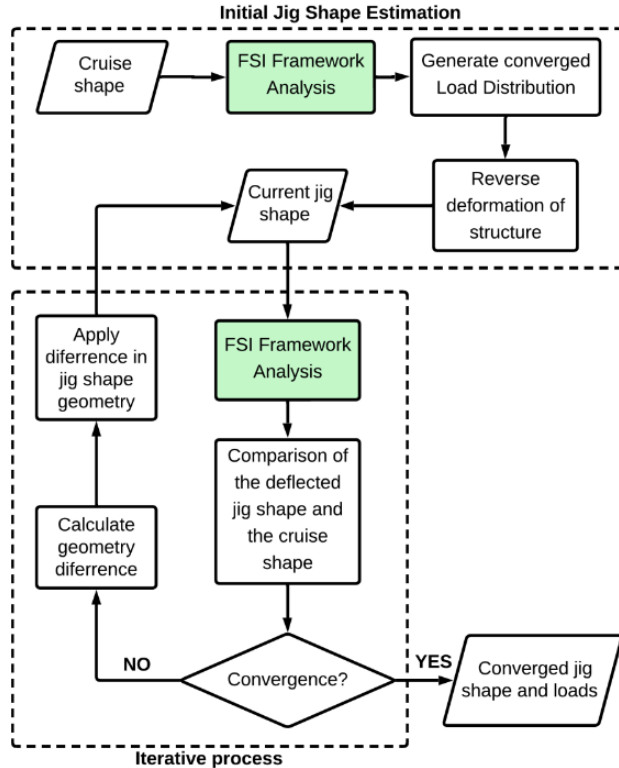


Fig. 6 – Proposed FSBJ Method

- RANS, SA, QCR, Mesh L2.
- Mach 0.85 Re 5M CL 0.5
- Departing from analysis flight shape to reach the jig-shape
- Fully theoretical
- Proprietary coupling with 3D loads calculation and aerodynamic mesh morphing.
- Presentation Wednesday 4:30PM. Fluid-structure Interaction Based Jig-shape (FSBJ) for transonic wings

CRM JIG SHAPE

- Challenge: obtain the Jig-shape from a flight shape
- Compare the FSI based method to an interpolation based



RESULTS

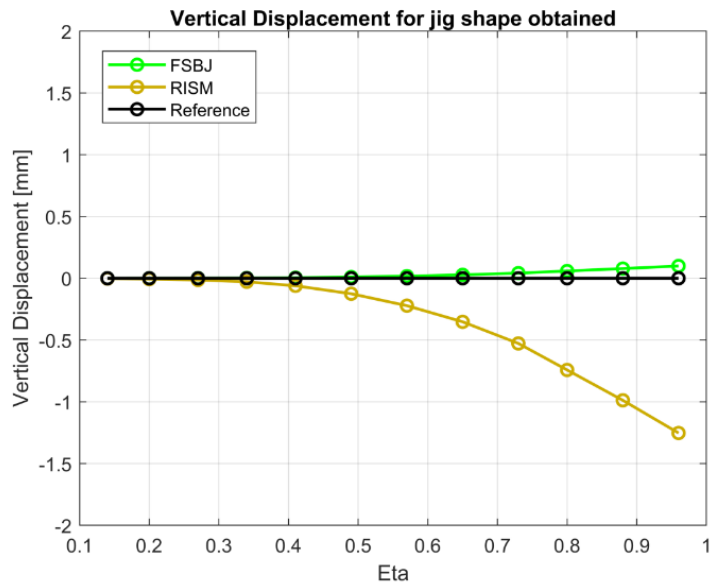


Fig. 7 – Displacement differences from reference JIG

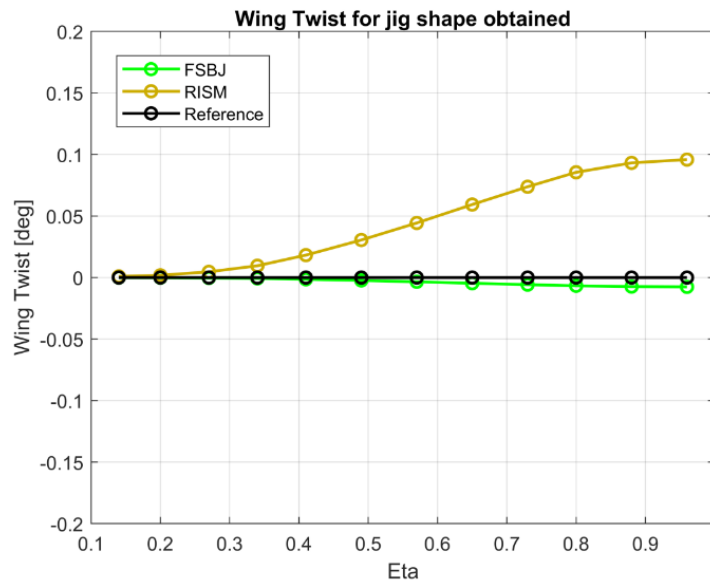


Fig. 8 – Twist differences from reference JIG

Reminder

Monday 8AM - June 8th – Plenary presentation



Maurílio Albanese
Director of Technology
Embraer

The presentation highlights Embraer's global presence and the transformative technologies we're developing for the future.

The strength of the collaborative innovation ecosystem we've built and the air mobility we are creating with EVE eVTOL.

The evolving skill sets we foresee as essential for our engineers and how we are preparing them to meet those demands.



Thank you !