Supersonic Configurations At Low Speeds (SCALOS)

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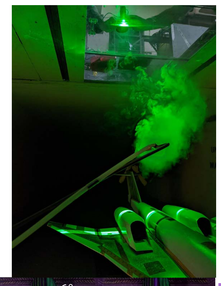
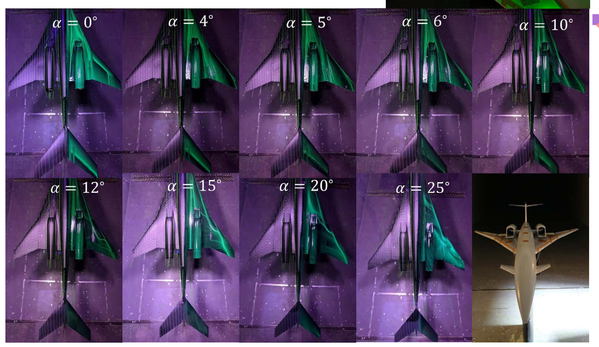
COLLABORATORS: Prof. Chester P. Nelson, Nick Mavriplis, SCALOS capstone 2020-2023
SPONSORS: NASA Commercial Supersonic Technology (CST)

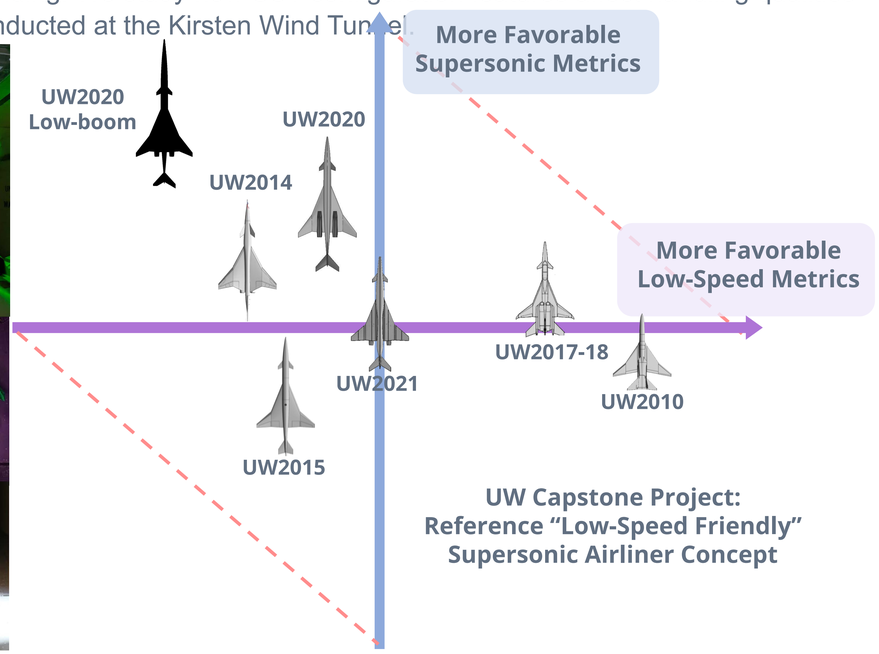
Project Overview [1, 4]

Published research supersonic transport (SST) configurations were often optimized at cruise speeds and neglected low-speed behavior at takeoff, approach, and landing. We study how SST configuration features affect handling qualities and dynamic stability and control. Tests were conducted at the Kirsten Wind Tunnel.

- Data reduction [1,4]
- Configuration study [2,5,6]
- Test Correlation [3]
- Control surface [5,6]
- Incremental Effect [6]
- Design Space Survey [7]
- Model Regression
- Stability and Control

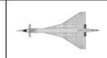
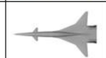
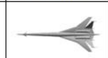
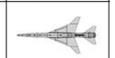
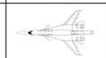
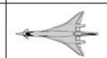
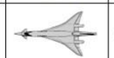
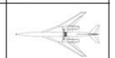






UW Capstone Project:
Reference "Low-Speed Friendly" Supersonic Airliner Concept

Design Space Survey [1, 4]

Concorde	NAC-60	L-2000	B-2707	Tu-144	L-1021J	L-1021J+	L-1021V	L-1044	L-QSTA
									
X-59	**B-765-070A**	**B-765-071B**	**B-765-072B**	**B-765-076E**	**B-765-078A**	**B QEVC**	**B Icon II**	**JAXA V**	**JAXA D-Send**
									
JAXA M	**S-21**	**QuietSpike**	**Gulfstream QSJ**	**HISAC-A**	**HISAC-B1**	**HISAC-B2**	**HISAC-C**	**HISAC-I**	**HISAC-II**
									
AS1	**AS2**	**AS3**	**S-512**	**Overture**	**Boom XB1**	**Exosonic**	**SonicStar**	**Tu-444**	**CU-E5**
									
UW-2005	**UW-2006**	**UW-2009**	**UW-2010**	**UW-2014**	**UW-S-2015A**	**UW-2016**	**UW-2017/18**	**UW-S-2020A**	**UW-S-2021A**

Test/Analysis Correlation Study [3, 7]

Aerodynamic Result/Analysis [2, 5, 6]

References

1. Nelson, C. P., **Ting, K.-Y.**, Mavriplis, N., Soltani, R., and Livne, E., "Supersonic Configurations at Low Speeds (SCALOS): Project Background and Progress at University of Washington," *AIAA Scitech 2022 Forum*, 2022, p. 1803.
2. **Ting, K.-Y.**, Mavriplis, N., Soltani, R., Nelson, C., and Livne, E., "Supersonic Configurations at Low Speeds (SCALOS): Model Geometry and Aerodynamic Results," *AIAA Scitech 2022 Forum*, 2022, p. 1800.
3. Mavriplis, N., **Ting, K.-Y.**, Moustafa, A., Hill, C., Soltani, R., Nelson, C., and Livne, E., "Supersonic Configurations at Low Speeds (SCALOS): Test / Simulation Correlation Studies," *AIAA Scitech 2022 Forum*, 2022, p. 1801.
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5. **Ting, K.-Y.**, Mavriplis, N., Soltani, R., Nelson, C., and Livne, E., "Supersonic Configurations at Low Speeds (SCALOS): The Aerodynamic Effects of Control Surfaces," *AIAA Scitech 2023 Forum*, 2023, p. 0229.
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