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Abstract title

Temperature Effect on the Structural Design of a Mach 8 Vehicle
Hypersonic aircraft design are a pressing area of research. The motivation to create aircraft that can cross the globe in only a few hours is driving this forward but there are a number of challenges that need to be overcome. One of the principle challenges is the effect that temperature has on the structure. Temperature changes cause heating of the structure as well as changing the material properties of the affected structure. This has a compound effect in that the structures gets geometrically deformed, stiffness is reduced, and this will have an impact on the aerodynamic and structural performance of the vehicle.

This article investigates the effect of two different structural lay-ups: a conventional rib-spar configuration and a pillow tank. A number of different structural options in terms of number of ribs / spars will be investigated. The structure will be optimised based on critical loading conditions. Results for various temperature distributions will be investigated, while looking at change on structural strength, in-flight static deformation and dynamic response.
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- ✔ Oral presentation
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Gareth Arthur Vio