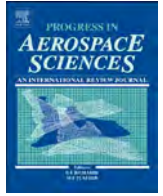




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# Challenges, Ideas, and Innovations of Joined-Wing Configurations: A Concept from the Past, an Opportunity for the Future

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## ABSTRACT

Diamond Wings, Strut- and Truss-Braced Wings, Box Wings, and PrandtlPlane, the so-called “JoinedWings”, represent a dramatic departure from traditional configurations. Joined Wings are characterized by a structurally overconstrained layout which significantly increases the design space with multiple load paths and numerous solutions not available in classical wing systems. A tight link between the different disciplines (aerodynamics, flight mechanics, aeroelasticity, etc.) makes a Multidisciplinary Design and Optimization approach a necessity from the early design stages. Researchers showed potential in terms of aerodynamic efficiency, reduction of emissions and superior performances, strongly supporting the technical advantages of Joined Wings. This review will present these studies, with particular focus on the United States joined-wing SensorCraft, Strut- and Truss- Braced Wings, Box Wings and PrandtlPlane.

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