

Bird Strike Simulations On Composite Aircraft Structures

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Bird Strike Simulations On Composite

Bird impact on composite wing leading edge As a second example the bird strike simulation on a composite wing leading edge slat with Abaqus/Explicit is presented. The leading edge structure consists of a composite skin, five composite ribs and a metallic back plate, connected by rivets and adhesive bonding.

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Bird Strike Simulations on Composite Aircraft Structures

The Johnson-Cook model was used for aluminum alloys LY-12 and 2024-T3 in [101] Simulations of bird strikes on composite plates can be found in [76, 87, 89,106,107]. With cohesive elements, Heimbs...

(PDF) Bird Strike Simulations on Composite Aircraft Structures

A methodology for the numerical simulation of bird strike on a novel leading edge (LE) structure of a horizontal tail plane is presented. The innovative LE design is based on the 'tensor skin' concept, comprising one or more folded composite sub-laminates that unfold during the bird impact, thus providing high-energy absorption characteristics.

Bird strike simulation on a novel composite leading edge ...

Aircraft bird strikes are a major threat to human life and systems that are immune to birds striking need to be built. This paper addresses the numerical simulation of the bird attack on a composite wing leading edge of the aluminium-silicon carbide (Al-SiC) metal matrix using LS-Dyna tools.

Numerical simulation of bird strike effect on a composite ...

Bird Strike Simulation of Composite Aircraft Structure AMTAS New Project Proposal • There is an increasing trend of birds colliding with aircraft. Aircraft are most susceptible to bird impacts during takeoff and landing. Typical impacts occur on components such as wing leading edges, radomes, turbofan engines, and cockpit windshields.

Bird Strike Simulation for Composite Aircraft Structure

Abstract The paper studies the bird strike against composite material tail leading edge under Chinese HB7084-94 condition, including material failure process, by using explicit finite element...

(PDF) Research on Bird Strike Simulation of Composite ...

This phenomenon can be ascribed to the same structural configurations and the identical input impact energy (E_{impact}) considered in present simulations. The bird-strike impact energy ($E_{\text{bird-strike}}$) is defined by the impact velocity and projectile mass as $E_{\text{bird-strike}} = 0.5 \times m_{\text{bird}} \times V_{\text{relative}}^2$, where m_{bird} is the mass of bird and V_{relative} is the relative velocity between the impacted structure and the projectile.

Bird-Strike Resistance of Composite Laminates with ...

The bird-strike impact energy ($E_{\text{bird-strike}}$) is defined by the impact velocity and projectile mass as $E_{\text{bird-strike}} = 0.5 \times m_{\text{bird}} \times V_{\text{relative}}^2$, where m_{bird} is the mass of bird and V_{relative} is the relative velocity between the impacted structure and the projectile. In present simulations, $E_{\text{bird-strike}}$ approximately equals

Bird-Strike Resistance of Composite Laminates with ...

For the numerical simulation of bird-strike incidents on composite structures, the stacked- Figure 3: Delamination damage detected at stiffened panel due to bird-strike impact shell approach has been developed and applied, as a promising alternative to the classical solid and shell elements approach.

BirdStrike

Composite laminates offer the potential for reducing the weight of civil aircrafts. However, a major hazard to civil aviation is bird-strike impact damage. In this paper, bird-strike impact damages of composite laminates are numerically investigated by means of Smoothed Particle Hydrodynamics (SPH) and finite element method (FEM) analysis.

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SPH-FEM simulation of impacted composite laminates with ...

Accurate bird strike simulation methodology for BA609 tiltrotor. In: American helicopter society 64th annual forum, Montreal, Canada, April 29-May 1, 2008. Google Scholar [143] Heimbs S. Bird strike simulations on composite aircraft structures. In: 2011 SIMULIA customer conference.

Review: Computational methods for bird strike simulations ...

Bird strike simulations are challenging because they are of short duration, cause large material deformation, and involve interactions between bodies with rapidly changing surfaces. The difficulty is increased by the need to model composite materials that include numerous layers, each with its own material, footprint, thickness and orientation.

To the Test - Volume X, Issue 2 | ANSYS

Bird Strike on Aircraft Radome: Dynamic Characterisation of Quartz Fibre Composite Sandwich for Accurate, Predictive Impact Simulations. 12th International Conference on the Mechanical and Physical Behaviour of Materials under Dynamic Loading (DYMAT2018), Arcachon, France, September 9-14, 2018.

Sebastian Heimbs: Publications

The Abaqus FEA product suite utilizes not only static, but also dynamic load case simulation such as impact, collision, BVID and bird strike. SIMULIA's product platform can evolve your composites simulation methodology to deliver more accurate results to meet regulatory and competitive demands.

Realistic Simulation for Composite Materials

LS-DYNA Tutorial | Analysis of SPH Bird Strike on Fan Blades | BW Engineering LS-DYNA Tutorial Book "LS-DYNA for Engineer: A Practical Tutorial Book ...

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LS-DYNA Tutorial | Analysis of SPH Bird Strike on Fan ...

Taking this into account, this work presents results of a bird strike simulation which included a bird mass used in certification (after FAR 25.571) at 90 m/s. The bird material used in this simulation is an EOS with properties which replicate a water and air mixture with 10% porosity, as described in Section III.

Numerical bird strike impact simulation of aircraft ...

A bird strike event on an aircraft composite structure can be successfully simulated with ABAQUS/Explicit using CEL approach. With its strong composite damage and failure modeling capabilities and general contact algorithm, ABAQUS/Explicit is an ideal tool for such highly dynamic, nonlinear applications.

Modeling Bird Strike using CEL Approach - Optimec Consultants

A validated simulation methodology has been developed to support the bird-strike certification of the carbon fibre epoxy composite, moveable trailing edge (MTE) of the Boeing 787 Dreamliner.

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