



Numerical simulation

The route to a virtual aircraft involves millions and millions of computer calculations

Brief description

Wind tunnel tests and flight tests are still indispensable in the development of new aircraft concepts. But thanks to increasingly powerful supercomputers, a third tool has been playing a crucial role in aeronautics research for some time now – numerical simulation. The film explains how important this is for the digitalisation of aeronautics.

Aims

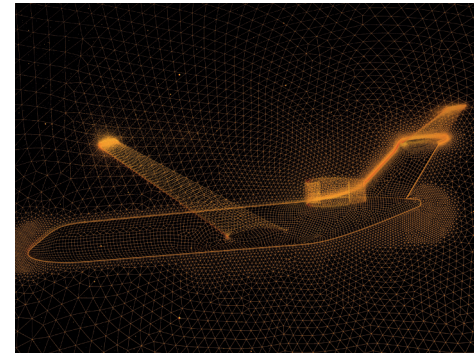
Numerical simulation aims to depict reality on the computer as accurately as possible. What the researchers envision is a digital maiden flight. As computing power continues to increase, this technology will make it possible to design an aircraft digitally, at lower cost and with fewer risks, to test it and eventually to certify large parts of it and have it perform its first flight 'in' the computer.

Applications

- Aircraft design
- Multidisciplinary simulation (aerodynamics, structure, flight mechanics, flight control)
- Virtual flight testing
- Noise reduction
- Increase in efficiency

Outlook

- Further development and optimisation of numerical simulation methods, prediction tools and computer software for aeronautics
- Supplementation of wind tunnel and flight tests with reliable simulation methods
- Digital design, testing and certification



Parties involved

DLR Institute of Aerodynamics and Flow Technology
Earth Observation Center
(film production)

Facts and figures

- Numerical simulation methods have been used in research since the 1990s
- The first high-performance computing cluster was established at DLR in 2007. From mid-2019, DLR will have a new cluster capable of performing 1.798 petaFLOPS per second

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