Collaborative complex system design applied to an aircraft system

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Aircraft systems have evolved dramatically since the beginning of aviation. Many improvements of performance and safety have been made. Now each sub-system has optimized performance and it is thus difficult to find gains without breakthroughs in architectures or technologies; and this is the objective of the R & D studies towards a more electric aircraft.

Simulations are widely used to explore and justify aircraft architectures [1], but system simulations currently suffer from limitations which make them difficult to use for complex multi-systems analysis. Therefore tools and processes must evolve to accompany these major changes in order to support the designers in their quest of optimized design.

This article deals with new processes and tools which will take part, in a close future, in the determination, the verification and validation of systems architectures (fig. 1)
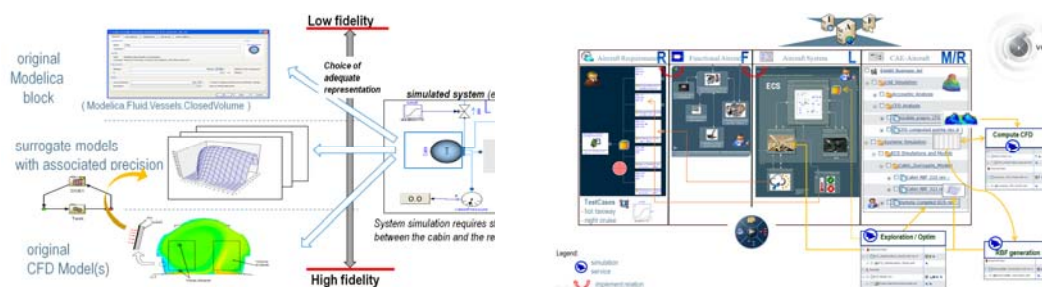

Figure 1: Use of CFD surrogate models in Modelica behavioral system, within V6 PLM framework

It sums up what should be a truly efficient tool for aircrafts systems design, and illustrate how it can be managed using Modelica within a collaborative V6 PLM framework.

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References

[1]   Advances in Product Modelling and Simulation at Dassault Aviation; Lionel de la Sayette; RTO AVT Symposium, April 2002