# Model Based Specifications in Aircraft Systems Design

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Executable specifications are computer algorithms written in an appropriate specification language with the purpose of demonstrating and verifying the compliance of the input-output behaviour of the model subject to the model specifications. Similarly, requirement modelling allows the specification and testing of demands on signals which are generated by a system or the model of a system. Together, executable specifications and requirement models enable a well-defined specification of a system.

While the traditional aircraft design process is based on document based specifications only, a model supported design process based on executable specifications and requirement models is thought to improve the process in terms of quality and time. In contrast to the traditional, more software oriented usage of executable specifications, we use them in a more general way also for specification of physical models and behavior.

In a former publication, MathWorks based tools were mainly used. In order to have a one-tool solution which allows better coupling of the physical models to requirement blocks, we show how it can be realized with Modelica based tools and libraries, especially with the new Modelica Requirements library.

For some requirements no ready to use requirement blocks were available. These were blocks for a funnel like constraint in time domain and blocks for constraints in frequency domain. The implementation of the FFT for frequency domain property monitors is non-trivial and often parameterization is implemented user-unfriendly. In the last part of the paper we present a user-friendly and numeric efficient implementation and give some overview on the implementation.

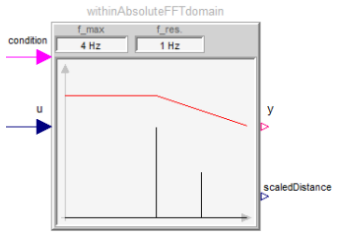


**Figure 1:** WithinAbsoluteFFTdomain FFT based property monitor for constraints in frequency domain