

Modellbibliothek VHDL-AMS

- Allgemeines zur Auftragsbearbeitung
- durchgeführte Arbeiten
- Kurzbericht vom Treffen in Leinfelden am 16.5.
- erste Version des Templates
- Prototyp Dokumentation
- Stand der Modellbibliothek
- SAE J2546 als Arbeitsgrundlage
- CVS für Versionsverwaltung
- Stand der IEEE-Packages
- Klärung von Fragen
- Vorstellung von nützlichen Literaturstellen und Büchern

Allgemeines zur Auftragsbearbeitung

- Lösungsvorschlag Würzburg, 03.07.02
- Angebotsphase ab 31.07.02
- Auftragseingang 06.12.02
- IB & HG bisher etwa 200 Arbeitsstunden

durchgeführte Arbeiten

- Besuch Saber User Group Meeting München, 08.10.02
- Erprobung Hamster
- Internet-Recherche, Befragung von Experten
- Vortrag ASIM-FGT Ulm, 11.03.03
- Besuch Reuter, Nickeleit bei BG am 21.03.03
- ASIM-Workshop Leinfelden, 16.05.03
- Besuch Fhg Dresden, 27.-28.05.03
- Prüfung Modelica.Electrical.Analog.Basic (Clauß, Schneider)
- Erarbeitung Template
- Prüfung BEAMS-Modelle
- Kodierung Bibliothek
- Prüfung von CVS
- Beschaffung von Büchern, SAE-Standard J2546

Kurzbericht ASIM, Leinfelden, 16.05.03

- Arbeitsgespräch "Modellbibliotheken und Simulationsdatenmanagement"
- intensive Diskussion mit etwa 10 Teilnehmern
- siehe .jpg-Dateien (dxcpicw)
- Kurzvortrag von Mr. Teegarden (Mentor): Hinweis auf SAE-Standard J2546, Hinweis auf Paragon von Dr. Alan Mantooh (Univ. of Arkansas)
- Verteilte Aufgaben: IB Sichten SAE J2546, Nickeleit andere Standards?, HG Fallstudie Simulation

Prototyp Dokumentation

- angelehnt an SAE J2546, Februar 2002
- Weiteres sh. für Template

Model Specification Process Standard

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APPENDIX B

EXAMPLE SABER MODELFILE HEADER LAYOUT

B.1 See Figure B1.

```
# MODELFILE HEADER TEMPLATE:
# (template name).xyz  DESCRIPTIVE NAME OF TEMPLATE WITH TOOL-SPECIFIC EXTENSION
#####
#
#           THIS TEMPLATE WAS CREATED BY:
#           SOCIETY OF AUTOMOTIVE ENGINEERS
#           ELECTRONIC DESIGN AUTOMATION COMMITTEE
#           MODELING TASK FORCE
#
#
#THE SOCIETY OF AUTOMOTIVE ENGINEERS DOES NOT ASSUME LIABILITY FOR THE USE
#OF THIS TEMPLATE OR THE RESULTS OBTAINED FROM USING IT.
#####
#
# RESPONSIBILITY      NAME and DEPT.      DATE
#
# PROGRAMMING         (programmer name)    mm/dd/yy
#
# DATA COLLECTION    (test person/data-source)
# MODEL THEORY        (developer of theory author)
# SOURCES OF THEORY
# SPECIFICATIONS      (specification writer)
#
#####
#
# DESCRIPTION:
#
# Fully describe the model's physics, limitations, inaccuracies, intended use, assumptions, and any other
# useful information to the user.
#
# NODE CONNECTIONS (If Applicable):
#
# Name                Type                Description
#
# INPUT ARGUMENTS:
#
# Name                Type                Units                Description
#
# OUTPUT SOLUTIONS:
#
# Name                Units                Description
#
# MESSAGES:
#
# List any messages that the model will display and fully describe their meaning. These may include any
# information that the model developer(s) thought would be useful to a simulation.
#
```

Figure B1a—

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```
# WARNINGS:
#
# List any warnings that the model will display and fully describe the implications of these warnings. These
# may include operation in invalidated or inaccurate regions. These may also include stresses
# that may be exceeding rated values: temperature, current voltage, etc...
#
#
# ERRORS:
#
# List any errors that may occur in the model that are sufficient to cause the simulation to abort. Fully
# describe the meaning of these errors, their associated messages, and the basis for deciding to abort a
# simulation. These may include entry of highly inaccurate regions, erroneous results,
# operation beyond unmodeled device failure, etc...
#
#
# SUPPORTING FILES:
#
# List the name and description of additional files necessary for the model to function properly. These can
# be foreign subroutines, external functions, sublevel templates when hierarchy is used, and special units
# files. An adequate description of each should follow, including key parameters exchanges and/or node
# connections.
#
#
# REVISION HISTORY:
#
# Programmer Name and Date:
# Fully describe the revision and what necessitated it.
#
#####
```

Figure B1b—

Prototyp Template

-- simple ARCHITECTURE of mass

-- Description:

-- This code was created by Avant! Corporation for use with VeriasHDL(tm) and
-- other VHDL-AMS simulators. Visit <http://www.VHDL-AMS.com> for the latest.
-- Copyright 1998 - 2001.

-- Messages: Text, auch mehrere Zeilen
-- Warnings: Text, auch mehrere Zeilen
-- Errors: Text, auch mehrere Zeilen
-- Supporting Files: Text, auch mehrere Zeilen
-- Literature: Text, auch mehrere Zeilen
-- Author: Ingrid Bausch-Gall
-- Revision History: ib 23-April-03
-- Source: VERSION VeriasHDL 1.4

Prototyp Template (Forts.)

```
USE work.energy_systems.ALL;
USE work.mechanical_systems.ALL;
ENTITY mass IS
    GENERIC (m: real);           -- Mass constant
    PORT ( TERMINAL pos : translational); -- Position connection
ARCHITECTURE simple OF mass IS
    QUANTITY  posn across force through pos TO translational_ref;
    QUANTITY  vel : real;

    BEGIN
        ASSERT m > 0.0
        REPORT "Mass should be greater than 0!"
        SEVERITY error;
        vel == posn'dot;
        force == -m*vel'dot;
    END ARCHITECTURE simple;
```

Erzeugte Dokumentation

- nur verwendete Schlüsselwörter müssen angegeben werden
- Dokumentation wird automatisch übernommen
- enthält zusätzlich:
 - verwendete Libraries (USE)
 - Generic
 - Port
 - Pin
 - Quantities
 - etc.

Beispiel für die Dokumentation

The screenshot shows a Netscape browser window displaying the documentation for a VHDL model named 'mass_simple.vhd'. The browser's address bar shows the title 'Documentation of VHDL-AMS models - Netscape'. The page content is structured as follows:

mass_simple.vhd
simple ARCHITECTURE of mass

Description

This code was created by Avant! Corporation for use with VeriasHDL(tm) and other VHDL-AMS simulators. Visit <http://www.VHDL-AMS.com> for the latest. Copyright 1998 - 2001.

Messages: Hier kommen vorhandene Messageeinträge hin
Warnings: Hier kommen vorhandene Warnungen hin
Errors: Hier kommen vorhandene Fehler hin
Supporting Files: Hier kommen vorhandene Supporting Files hin
Literature: Literaturstelle1
Literaturstelle2
Literaturstelle3
...
Author: Ingrid Bausch-Gall
Revision History: ib 23-April-03
Source: VERSION VeriasHDL 1.4
Libraries: work.energy_systems.ALL;
work.mechanical_systems.ALL;

Generic

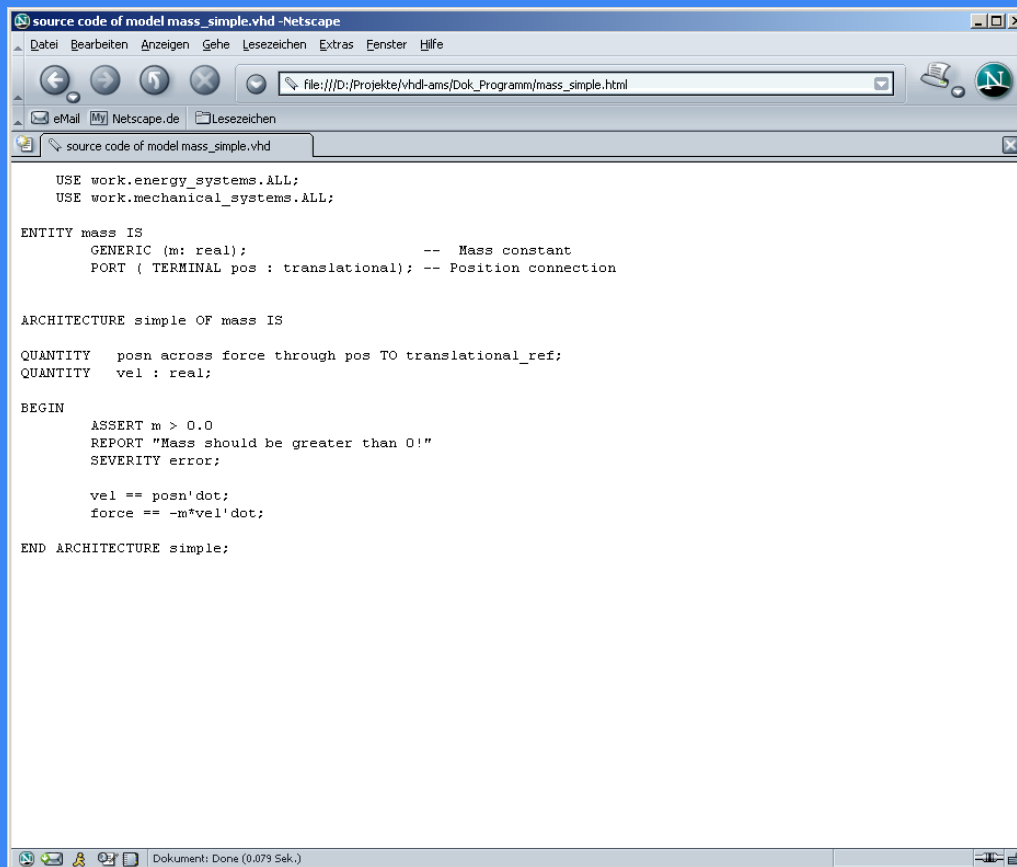
Variable	Type	Default	Description
m	real		Mass constant

Ports

Type	Variable	Property	Description
TERMINAL	pos	translational	Position connection

[see source code of model mass_simple.vhd](#)

Wahlweise auch Modelltext



The screenshot shows a Netscape browser window with the title "source code of model mass_simple.vhd - Netscape". The address bar shows the file path: "file:///D:/Projekte/vhdl-ams/Dok_Programm/mass_simple.html". The browser window displays the following VHDL code:

```
USE work.energy_systems.ALL;
USE work.mechanical_systems.ALL;

ENTITY mass IS
    GENERIC (m: real);           -- Mass constant
    PORT ( TERMINAL pos : translational); -- Position connection

ARCHITECTURE simple OF mass IS

    QUANTITY  posn across force through pos TO translational_ref;
    QUANTITY  vel : real;

    BEGIN
        ASSERT m > 0.0
            REPORT "Mass should be greater than 0!"
            SEVERITY error;

        vel == posn'dot;
        force == -m*vel'dot;

    END ARCHITECTURE simple;
```

Stand der Modellbibliothek

- Dateien zeigen
- Läufe mit Hamster
- Vergleichsläufe mit SPICE

SAE J2546 als Arbeitsgrundlage

- Beschaffung über www.sae.org
- durchgehen mit Folien
- Anpassung an Bedarf von VDA/FAT-AK30

CVS für Versionsverwaltung

- Vortrag!

Stand der IEEE-Packages

- letztes Treffen der WG war am 06.03.03
- ENERGY_SYSTEMS
- ELECTRICAL_SYSTEMS
- MECHANICAL_SYSTEMS
- THERMAL_SYSTEMS
- FLUIDIC_SYSTEMS
- RADIANT_SYSTEMS
- FUNDAMENTAL_CONSTANTS
- MATERIAL_CONSTANTS

Klärung von Fragen

- aus Besuch bei Fhg Dresden
- Gestaltung homepage VHDL-AMS bei www.bausch-gall.de
- "offizieller" Verteiler für Statusberichte
- Einbindung Fhg Dresden
- Modelle vorerst als eine Datei, Einwände?

Literaturstellen und Bücher

- Dr.Haase "Regeln für die Erstellung ... "
- Studienarbeit FHTE "Mod.&Sim. ..."
- Huss "VHDL-AMS-Tutorial", Bremen, 13.05.02
- Handbuch EDA, "Systemsimulation"
- Cooper "The Designer's Guide to ... "
- Huss "Model Engineering ... "
- Hoefler/Nielinger "SPICE"
- SPICE 3 Version 3F5 User's Manual
- SAE J2546
- Fogel "Open-Source-Projekte mit CVS"