

## **APPENDIX B**

### **Introduction to Various Software Tools used for the Research Work**

#### **About PSIM Simulation Software**

PSIM is a simulation software designed for power electronics, motor control, electrical system simulation and dynamic system simulation. PSIM is ideal for circuit level and system level simulation, control loop design, motor drive system and other dynamics studies.

The basic PSIM package consists of three programs:

- PSIM Schematics
- PSIM Simulator and
- Wave display program SIMVIEW

PSIM schematics includes a comprehensive library of electrical engineering items:

- Power circuits: RLC branches, switches, transformers
- Control circuits: Filters, function blocks, logic elements
- Sources: Voltage, current, time
- Others elements: switch controllers, sensors, probes, non linear elements and so on and has a lot of sample circuits.

Key Features:

- Simple to use
- Fast simulation
- Flexible control representation
- Built in modules
- Link to external C-code
- Run-time waveform display
- Frequency response analysis
- Parameter sweep

PSIM 6.0 simulation software is from POWERSYS, Les Grandes Terres, and 13650 Meyrargues, France.

## **Visual Basic Software**

Visual Basic is a Graphical User Interface (GUI). The real-time view of the program can be obtained from this software. Also the programming becomes quite easy and simpler than the other mediums of programming. Following are few of the main advantages of Visual Basic than the manual calculations as well as over the Object Oriented Programming or basically over Character User Interface (CUI) i.e. C / C<sup>++</sup>:

- VB works as Graphic User Interface (GUI) and the programming is easy to understand and debug.
- Calculations in VB are quite fast and accurate along with its real time view.
- Programming in VB is also very easy as it is in packets i.e. small programs are to be written for each components added in the software which helps to debug the program easily.
- VB also helps to include the wide range of objects thus making the programming very simple and easy for the observer to understand.

## **About MATLAB**

MATLAB is a high performance language for technical computing. It integrates computation, visualization and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include:

- Math and computation Algorithm development
- Data acquisition Modeling, simulation and prototyping
- Data analysis, exploration and visualization
- Scientific and engineering graphics
- Application development including graphical user interface building

MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. This allows solving many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it

would take to write a program in a scalar non interactive language such as C or FORTRAN. The name MATLAB stands for matrix laboratory was originally written to provide easy access to matrix software developed by the LINPACK and EISPACK projects. Today MATLAB engines incorporate the LAPACK and BLAS libraries, embedding the state of the art in software for matrix computation.