

2.03. SOFTWARE FOR SIMULATING ASYNCHRONOUS MOTORS AS A PART OF ELECTROMECHANOTRONIC SYSTEMS

The software tools are intended for simulating asynchronous motors (AM) as a part of electromechanotronic systems (EMTS): semiconductor converter – AM – working mechanism.

Input data: a structure of the strings of stator winding - sections' side numbers, number of turns, wire cross; diagram of winding turns interconnection - inclusion matrices in accordance with Kirchhoff's laws; MMF harmonic orders that are taken into account; geometric dimensions of magnetic circuits and current-conducting wires; characteristics of electrotechnical materials.

Output data: the values of operating currents, moments, speed, efficiency and power.

Advantages:

- take into account the features of stator winding circuit: unsinusoidality, asymmetry, arbitrariness of connection diagram and configuration of winding turns;
- integrated into MATLAB-Simulink environment (SimPowerSystems library);
- provide simulation of working conditions taking into account dynamic processes, characteristics of AM as a part of EMTS;
- provide high accuracy of simulation (an error when calculating current and moment characteristics of AD does not exceed 5% over the entire range of slides);



the refined values of electromagnetic parameters of the AD of EMTS and the dependences of their changes are determined by the results of quasi-three-dimensional field analysis.