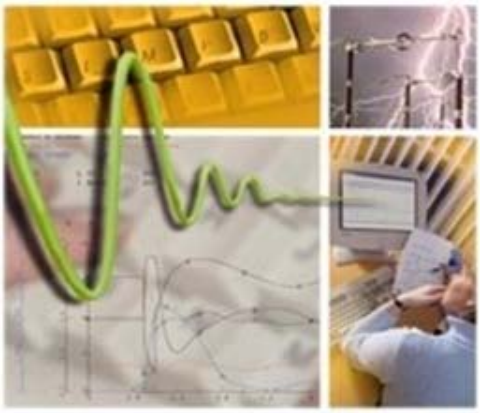
SIMPOW®- Dynamic Analysis



Used for large power systems e.g. for traditional stability studies, and in case of small power systems, studies with requirement of detailed time resolution.

Robust numerical techniques assure retained accuracy and numerical stability also for long-term simulations.

Studies

- Transient angle stability
- Small-disturbance angle stability
- Voltage stability
- Frequency stability
- Harmonic analysis
- Subsynchronous resonance
- Ferroresonance
- Machine transients and EMT
- Power system analysis for electric traction etc.

Features

- Analysis both in time and frequency domain
- Analysis in both fundamental frequency and instantaneous value mode under steady state or disturbed symmetrical or unsymmetrical conditions
- Switch between phasor and instantaneous value mode during simulation
- Instantaneous value representation in some parts of a system and phasor representation in the rest of the system
- Variable or fixed time step
- Implicit predictor-corrector method of integration for simultaneous solution of all algebraic and differential equations
- Combination of Gear's integration method and the trapezoidal integration method with automatically controlled variable time step
- Extensive library for hundreds of models or build your own models

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Phasor mode

For feasibility check and tuning of regulators in order to increase the power transmission capability and improve transient stability etc.

Calculates by phasor models the power-frequency components of AC system and the average values of DC system voltages and currents. The primary components are repree sented as positive, negative and zero sequence quantities.

Studies

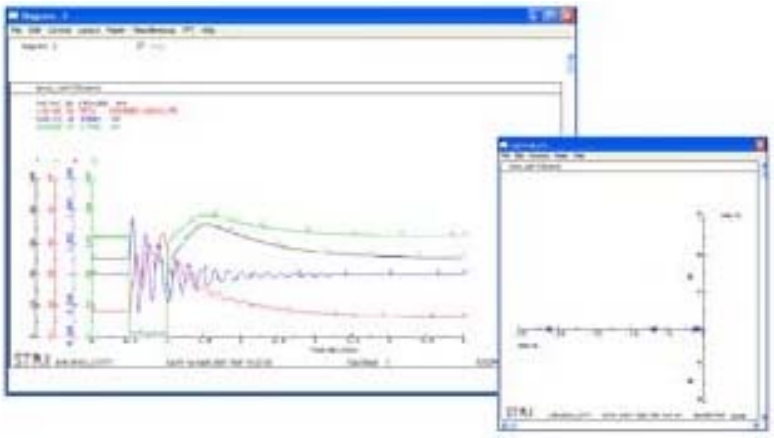
- Transient angle stability
- Small-disturbance angle stability
- Voltage stability
- Frequency stability
- System analysis for power supply of electric traction

Features

- Analysis both in time and frequency domain
- Variable or fixed time step
- Robust numerical technique
- Calculation of Fast Fourier Transform, FFT

Dynamical models

- Basic models such as nodes, lines, transformers, series reactors and capacitors, varistors, shunt impedances, voltage and frequency dependent loads, synchronous and asynchronous machines, double fed asynchronous machine, mechanical loads, turbines, turbine governors, exciters and voltage regulators, power system stabilisers etc.
- Advanced models such as rotary-, HVDC-, PWM- and cyclo converters,
- Build your own models with the high level programming language DSL (Dynamic Simulation Language), e.g. drive systems and special machines



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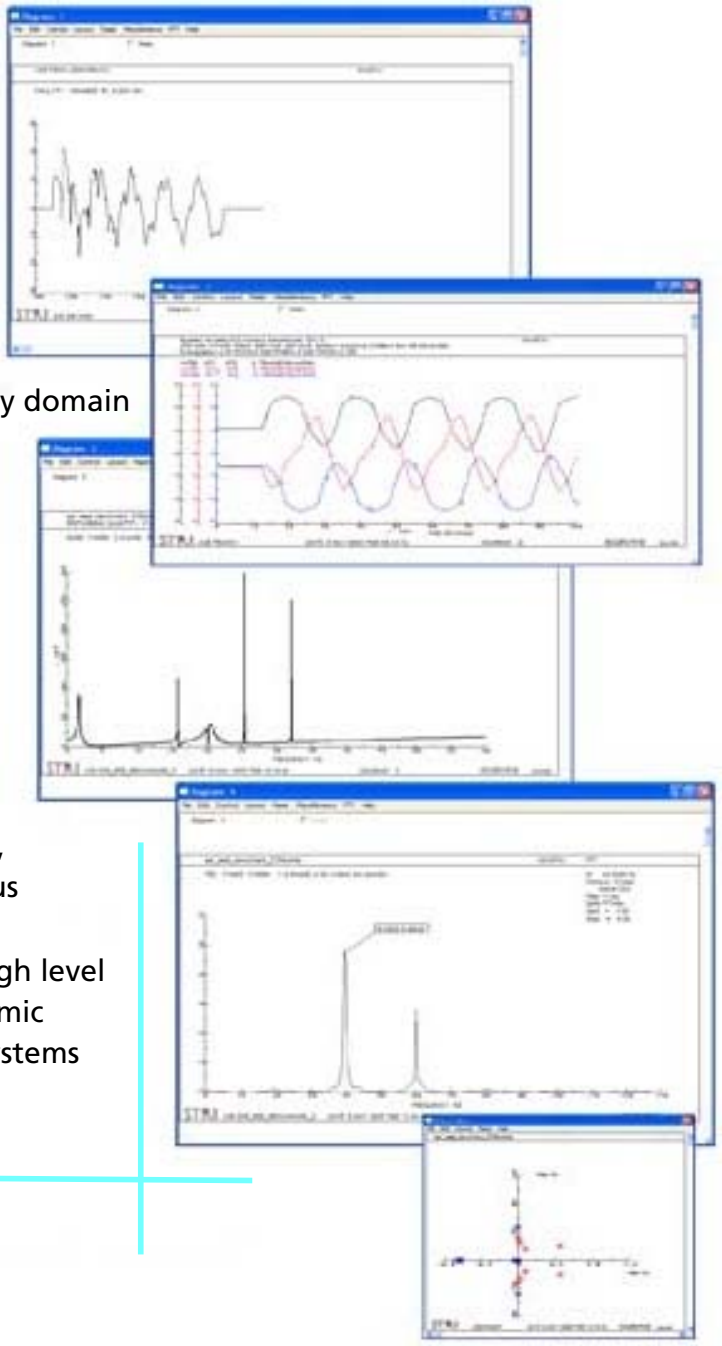
Instantaneous value mode

For simulation of the detailed dynamic performance of induction and synchronous machines during start and load switching conditions, e.g. in industrial power plants with different types, sizes and design of diesel generator and gas turbines sets etc.

Calculates the instantaneous values of voltages and currents. Primary components are represented by their dq0 quantities.

Typical phenomena studied

- Subsynchronous phenomenon
- Ferroresonance
- Start-up of synchronous machine
- Inrush currents
- Harmonics



Features

- Analysis both in time and frequency domain
- Variable or fixed time step
- Robust numerical technique
- Fast Fourier Transform, FFT
- Line parameter calculation

Dynamical models

- Transformer with magnetising and saturation characteristics, ferroresonance models, inertia models, high frequency line model, synchronous machine, asynchronous machine
- Build your own models with the high level programming language DSL (Dynamic Simulation Language), e.g. drive systems and special machines

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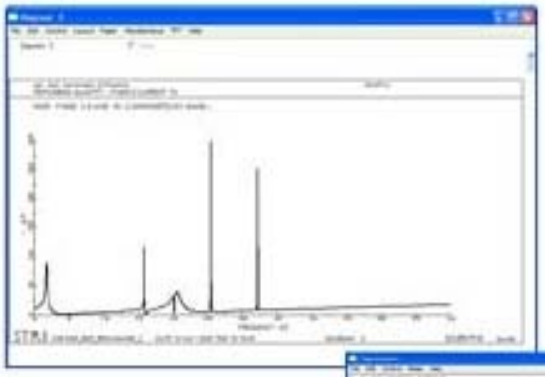
Linear analysis

Eigenvalue calculation and frequency response techniques in the frequency domain. These include linearisation of the power system equations at the actual operating point and consider incremental changes of the state variables around the operating point.

These techniques are excellent tools for the study of small signal stability of generators and automatic control systems.



Studies

- Small-disturbance angle stability e.g. controller interaction
- Tuning of Power System Stabilisers (PSS)
- Subsynchronous resonance
- Harmonic analysis

Features

- Frequency scanning
- Eigenvalues in both phasor and instantaneous value mode
- Eigenvalue sensitivity with respect to parameters
- Eigenvalues locus diagram, when varying an influencing parameter value
- Modal analysis visualised in the single-line diagram as mode shape, mode angle and participation factor
- Applicable at any time during a time-domain simulation

More information and free demo at
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