Test Bench for Simulation of Wind Power Drive Systems

Technical data

- Drive system with servo asynchronous machine to simulate wind loads (Siemens)
- asynchronous machine with slip ring rotor (Emod) as test object

<table>
<thead>
<tr>
<th>Emod</th>
<th>Siemens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated power 11 kW</td>
<td>29 kW</td>
</tr>
<tr>
<td>Maximal power 19.5 kW</td>
<td>82 kW</td>
</tr>
<tr>
<td>Rated speed 1450 rpm</td>
<td>2300 rpm</td>
</tr>
<tr>
<td>Maximal speed 1500 rpm</td>
<td>4600 rpm</td>
</tr>
<tr>
<td>Rated torque 72 Nm</td>
<td>120 Nm</td>
</tr>
<tr>
<td>Maximal torque 132 Nm</td>
<td>340 Nm</td>
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</tbody>
</table>

Equipment

- Rapid control prototyping system: dSPACE DS1006 QuadCore Controller Board
- Converter Siemens: Sinamics S120 with S7-300 SPS
- Converter Emod: Two LTi ServoOne S084.045.1 (BG5) in back-to-back order
- Control and pulse pattern for the LTi converters by dSPACE via PGI1 LTi TWINsync interface

Measurement technology

- Torque: Lorenz DR2112-R – 500 Nm (accuracy class 0.2 %)
- Speed: Sick Hiperface (SinCos) SFM60 1024 per rad., 4096 multiturn
- Voltage, current, power maps: Yokogawa WT1800 (accuracy class 0.01 %)

Current application/ Opportunities

- Lecture-accompanying demonstrator
- Three possible operations for Emod as the test object:
  - asynchronous machine with squirrel cage rotor (grid operation)
  - inverter-fed asynchronous machine with squirrel cage rotor
  - double-fed induction generator (DFIG)
- simulation of other wind energy drive systems

Equipment

- Current application/Opportunities
- Measurement technology