CALL FOR PAPERS

Modeling and Advanced Control of Wind Turbines/Wind Farms

**Theme:** In the last decade, wind power has experienced one of the most substantial growths of a variety of power generation sources. Since rich wind resources usually distributes far from load centers, integrating large-scale wind power with a long-distance transmission system is one of the typical options in many areas of the world, such as Texas in US, Three-North areas in China, and offshore wind in North Sea. Under this scenario, wind turbines integration may suffer from weak AC grid with small short-circuit ratio (SCR) and/or low system inertia. First, low-SCR grid requires seriously consideration of farm-/system-level interactions, such as resonances, instability on various spectrums of frequencies, etc.. Second, different from the conventional thermal and hydropower generating units, the modern megawatt (MW) wind turbines with variable-speed operation are typically not very responsive to system frequency support. These characteristics significantly challenge the reliability and security of power systems with highly-penetrated wind energy. The emerging control technology promises power-electronic-interfaced wind turbines as well as large-scale wind farms to provide active and reactive powers to grids on a wide timeframe, as stabilizers of conventional generating units. The main objective of this special issue is to seek publications that highlight recent advances and breakthroughs in the technology of modeling and enhanced active/reactive power control of wind energy conversion systems, ranging from components of wind turbines to wind farms. The topics of interest include, but are not limited to:

- Modeling, analysis and remedies for a variety of resonance phenomena, such as medium-/high-frequency harmonic resonances and sub-/super-synchronous oscillations, within wind turbines/farms
- Active power regulation and controller design, including synthetic inertial control and primary frequency control, of wind turbines/farms integrated into low-inertia grid
- Reactive power control schemes for wind turbines/farms, in particular when attached to low-SCR grid
- Fault ride through operation and fault behavior analysis of wind turbines/farms in weak AC grid
- Monitoring, prognostics, diagnostics, and reliability of various components of wind turbines with enhanced active/reactive power control
- Dynamic modeling methodology of wind turbines for farm-/system-level studies on a wide range of frequencies

**Manuscript Preparation and Submission**

Prior to preparing a full paper, please prepare a 500 - 1000 word **Extended Abstract.** Please submit your Extended Abstract in electronic form via email to the Guest Editor-In-Chief, Prof. Jiabing Hu (j.hu@hust.edu.cn). Please always put “IEEE TEC Special Issue on Modeling and Advanced Control of Wind Turbines/Wind Farms” in the subject line in all your correspondence. The team of Guest Editors will evaluate the submitted abstracts for appropriateness and timeliness. Based on scope and suitability for this special issue, the authors will be invited to submit full papers, which will then undergo a peer review process. The **Full Manuscripts** will be submitted in electronic form through the Manuscript Central web site: [http://mc.manuscriptcentral.com/tecpes](http://mc.manuscriptcentral.com/tecpes). On the submitting page #1 in popup menu of manuscript type, select: **Special Section: Modeling and Advanced Control of Wind Turbines/Wind Farms.**

**Timetable**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline for submission of abstracts</td>
<td>May 15, 2016</td>
</tr>
<tr>
<td>Announcement of selected abstracts</td>
<td>May 30, 2016</td>
</tr>
<tr>
<td>Deadline for submission of full manuscripts</td>
<td>July 31, 2016</td>
</tr>
<tr>
<td>Completion of first round of review</td>
<td>October 15, 2016</td>
</tr>
<tr>
<td>Deadline for submission of revised paper</td>
<td>January 31, 2017</td>
</tr>
<tr>
<td>Manuscript final decision</td>
<td>March 31, 2017</td>
</tr>
<tr>
<td>Estimated publication date</td>
<td>June, 2017</td>
</tr>
</tbody>
</table>

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