Applications of Predictive Control in Microgrids

Microgrids have emerged as a promising solution to accommodate the integration of renewable energy resources. However, the fluctuating outputs from renewable energy resources and variable power demand have posed many challenges such as voltage/frequency fluctuations. Meanwhile, with the increasing penetration of renewable energy resources and the associated electronic interfaces, the development of high-performance control strategies has attracted much attention in global academic and industry communities. So far, conventional control methods such as cascaded linear control still lack sufficient control flexibility and intelligence to handle these fluctuations, resulting in stability problems and power quality issues. On the other hand, predictive control has been very successful in power electronic converters and complex systems. Due to its fast transient response and flexibility in considering different constraints, predictive control shows huge potentials in microgrid applications.

Editors invite original manuscripts presenting recent advances in these fields with special reference to the following topics:

- ** Finite control set model predictive control (FCS-MPC) and/or continuous MPC of power converters 
- ** Advanced grid integration of renewable energy sources 
- ** Distributed generation 
- ** Power balance and energy management 
- ** Power quality issues (harmonics, voltage/frequency deviations, etc.) 
- ** AC, DC, or AC/DC microgrids 
- ** Special inverters for microgrids supplied by green cells 
- ** Distributed predictive control of microgrids with renewables 

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<table>
<thead>
<tr>
<th><strong>Deadline for manuscript submissions:</strong></th>
<th><strong>Information about manuscript acceptance:</strong></th>
<th><strong>Publication Date:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>July 31, 2019</td>
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</tr>
</tbody>
</table>

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