Power Line Communications: information flow through the grid

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Abstract. The telecommunication infrastructure is an important component of the Smart Grid where it is necessary to support two-way energy and information flows, manage power outages, facilitate the integration of renewable energy sources and offer tools to the consumer for optimizing the energy consumption. Power line communication (PLC) is among the most important data communication technology candidates for application in the Smart Grid since the grid is not only the information source but it also offers the infrastructure for the information delivery. This talk will offer an overview of PLC and its recent advances. The role and application of PLC in HV, MV and LV networks will be discussed. State-of-the-art solutions, standards as well as open challenges will be described.

In particular, we will discuss the important topics of channel and noise modeling and report up-to-date results about statistical channel modeling. The main challenges of physical layer design for both narrow-band (NB-PLC) and broad-band PLC (BB-PLC) to encompass the presence of channel attenuation and frequency selectivity, interference, and various noise sources will be presented. Some similarities and differences with the wireless communications scenario will also be discussed.