**ID: 238 E**

**Communication & Information**

**Applications of PMU for Monitoring and Control in Power Systems**

**ייסומים של מדידות פאזוריות במערכות הספק ורשתות חשמל**

**Prof. Aleksei Korolev**

SATEC, Israel

akorolev@satec-global.com 052-6347719

The paper describes main principles used in state-of-the-art monitoring and control systems based on phasor measurement devices (PMU). The necessity of PMU and details of ANSI C37.118.1-2011 standard are described. The concept of state estimation in power systems is described. The background of state estimation techniques in power systems is considered. Advantages of state estimation systems are shown. The difference between legacy non-linear state estimation calculation engines versus engines based on PMU devices are considered with numerical examples. Main features of modern PMU devices for monitoring and control in power systems are presented including monitoring and analysis of transients. Using of PMU for fault location detection is considered. The other concepts of PMU for harmonic analysis and state estimation are presented due to the growing importance of harmonic power flow analysis.



Aleksei Korolev, PhD

An electrical engineer from MIIT, Moscow (2009), in which he continued to second degree in 2013. In 2011 he joined the Russian representative of ETAP, where he had worked up to 2022 as the head of engineering group responsible for engineering, R&D and communication to universities. In 2017 he became a visiting professor at MIIT.

In 2022 Dr. Korolev joined R&D division of SATEC.

His main specialization is digital modeling of power systems feeding electrified railway traction.

During his career he published more than 10 articles and publications, supervised more than 15 graduate theses and conducted more than 15 ETAP workshops as a Certified ETAP Trainer.