



## Quality of power energy from wind power plant

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### 1. Brief introduction

The aim of this paper is to measure the quality of power coming from the wind power plant to the electrical distribution network. The quality of electrical energy includes many parameters but the main thesis target is to measure a harmonic frequency of current.

I used the program Matlab for the simulation of the connection between the wind power plant and the electrical network. I simulated startup of the wind turbine and changes of wind flowing. Obtained data were plotted on graphs which show harmonic frequencies of current based on these changes.

### Key words:

Wind turbine, power quality, modelling of wind power plant, harmonic frequency

### References

- [01] T.Petrů – Modeling of wind turbines for power system studies- Göteborg, Sweden 2003
- [02] M.P. Donsión – Análisis de la estabilidad de sistemas de potencia – Universidade de Santiago de Compostela 1993, ISBN: 84-7191-985-0
- [03] W. M. Nicholas , J. Sanchez-Gasca, W. Price, R. W. Delmerico, "DYNAMIC MODELING OF GE 1.5 AND 3.6 MW WIND TURBINE-GENERATORS FOR STABILITY SIMULATIONS," GE Power Systéme Energy Consulting, IEEE WTG Modeling Panel, Session July 2003
- [04] NOHÁČ, K.; NOHÁČOVÁ, L. Přehled současných možností počítačové simulace v elektroenergetice. In *Česká energetika a elektrotechnika*. 2004, č.3+4, s.20-24, ISSN 1213-4171.
- [05] S. Casoria, P. Brunelle, and G. Sybille, "Hysteresis Modeling in the MATLAB/Power System Blockset," Electrimacs 2002, École de technologie supérieure, Montreal, 2002.
- [06] F. Rajský – Modeling of wind power plant. In *Environmental impacst of power industry 2008*. Plzeň : Západočeská univerzita v Plzni, 2008. ISBN 978-80-7043-
- [07] F. Rajský – Preventing faults in a distribution network. In *Environmental impacst of power industry 2007*. Plzeň : Západočeská univerzita v Plzni, 2007. s. 72-75. ISBN 978-80-7043-541-0
- [08] F. Rajský and M.P. Donsión - Comparison of transmission and distribution systems in the Czech Republic and Spain . In *International Conference on Renewable Energy and Power Quality (ICREPQ'08)* page 93,94 - Santander 2008, ISBN 978-84-611-9289-2