# Abstract

**Antonio Sunjerga, "Evaluation of the grounding system impedance of wind turbines via different approaches", 2017.**

Wind energy is one of the fastest growing electric power generation technologies. It is well-known that wind turbines are vulnerable to lightning, which can cause important damages to wind turbine components. The aim of this project is to evaluate grounding impedance of wind turbine.In Chapter 2, we present the mathematical formulation of Matrix Pencil Method (MPM). MPM is tested on simple analytical functions namely double exponential function. The method is used in Chapter 8 as a means of noise cancellation. Impedance measurement circuit are presented and discussed in Chapter 3. To investigate tower effects on grounding measurements, first the tower impedance is analyzed separately in Chapter 4. Simple tower model as well as wind turbine model are presented and discussed. Both transmission line (TL) approach and full-wave (FW) approach are considered. Full structure with the grounding and the tower is analyzed in Chapter 5. As in Chapter 4, results are obtained with both TL and FW approach. Time domain analysis of voltage and current is presented in Chapter 7. Real case scenarios using measured data obtained at Mont Crosin wind turbine park are presented in Chapter 8.