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Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud

Instrumentation, Monitoring and Control System for Lightning Measurements on the Säntis Communications Tower

A. Rubinstein, F. Rachidi, D. Pavanello,
M. Rubinstein, G. Diendorfer, C. A. Nucci

Outline

- Introduction
- Objectives
- Work plan

Introduction

- Pioneering work on towers in Switzerland was done by Berger and coworkers, Montandon and Beyeler
- The present project is based on the EPFL Lightning Group preparatory work done in the past 5 years or so

Introduction

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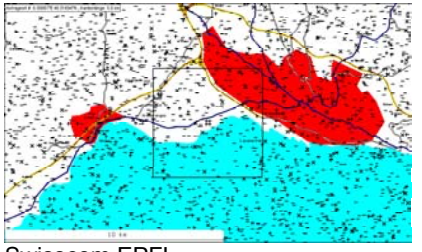
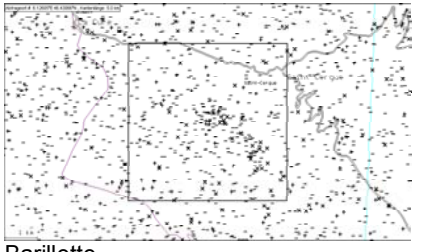
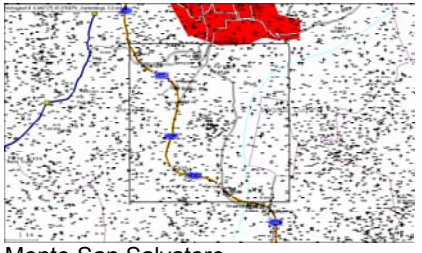
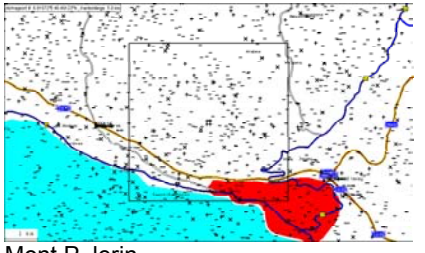
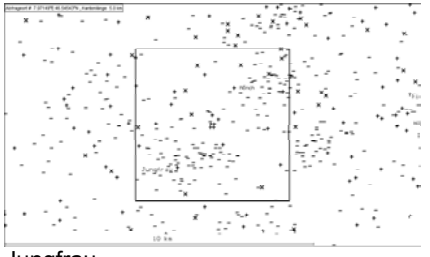
- Lightning impacts over a 3.5 year time period
- Jungfrau tower region: 152 Strokes
- Monte Salvatore tower region: 668 Strokes
- Säntis tower region: more than 4'300

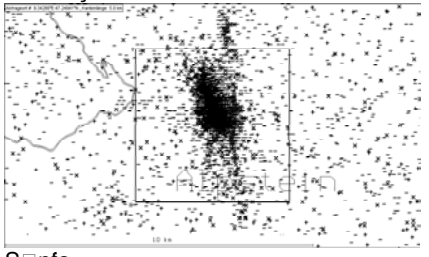

Swisscom EPFL


Barillette


Monte San Salvatore


Mont P, lerin


Jungfrau


S□nts

The Säntis

- Northeastern part of Switzerland
- Säntis mountain: 2’505 m ASL
- The tower: 124 m tall
- The temperature gets as low as -15 C **inside** the tower

Introduction (cont)

- Struck by lightning over 400 times a year
- Unique structure to collect experimental information

Objectives

- Instrument the Säntis Tower
  - Lightning Currents
  - Lightning Electric and Magnetic Fields
  - Storm Detection System (Field mill)
- Remote Maintenance, Monitoring, Calibration and Control System
- Long term:
  - Enlarging our measurement database
  - Improving our understanding of the lightning phenomenon
  - Create a Center for Lightning Research where international groups can conduct experiments and share data

Work Plan

- Specification
- Design, construction, procurement and lab testing of the measurement system
  - Sensors
  - Data acquisition
  - Temporary storage
- Design, implementation and lab testing of the monitoring, management, control and calibration system
- Installation and field testing
- Real conditions testing (planned for Summer 2009)

Work Plan (cont)

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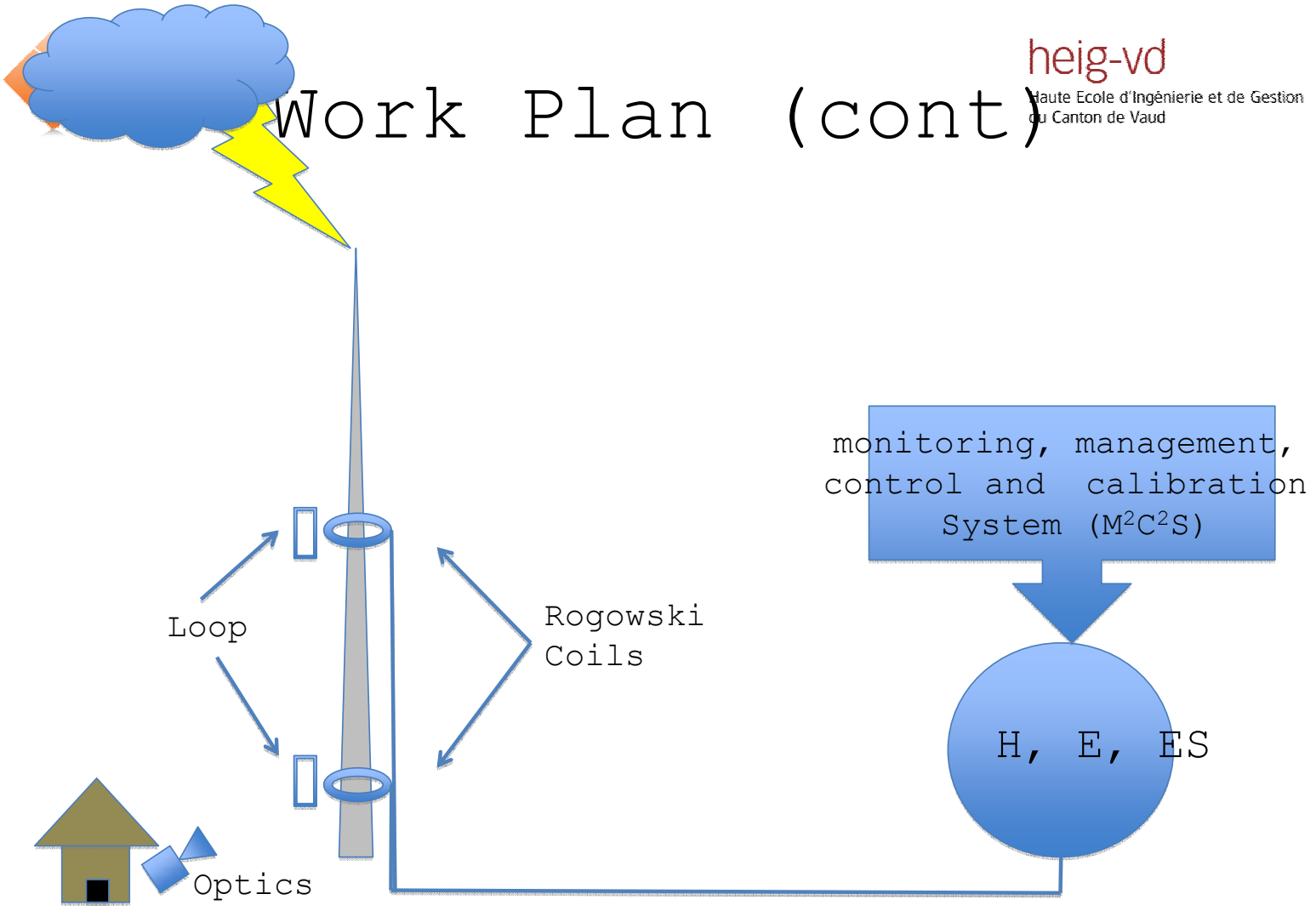

M^2C^2S functions

- Monitoring of the health and environment of all subsystems, including sensors, communication link, data acquisition and recording subsystems
- Calibration of measurement subsystems
- Transfer and backup of data
- Control of system settings

Thank you!