Rain attenuation of 58GHz radio signal

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Introduction

From 8 to 14 week I worked for Space technology laboratory supervised by Dr. László Csurgai-Horváth. Our project is to measure how rainfull effects the propagation of a 58Ghz radio signal.

Why 58GHz?

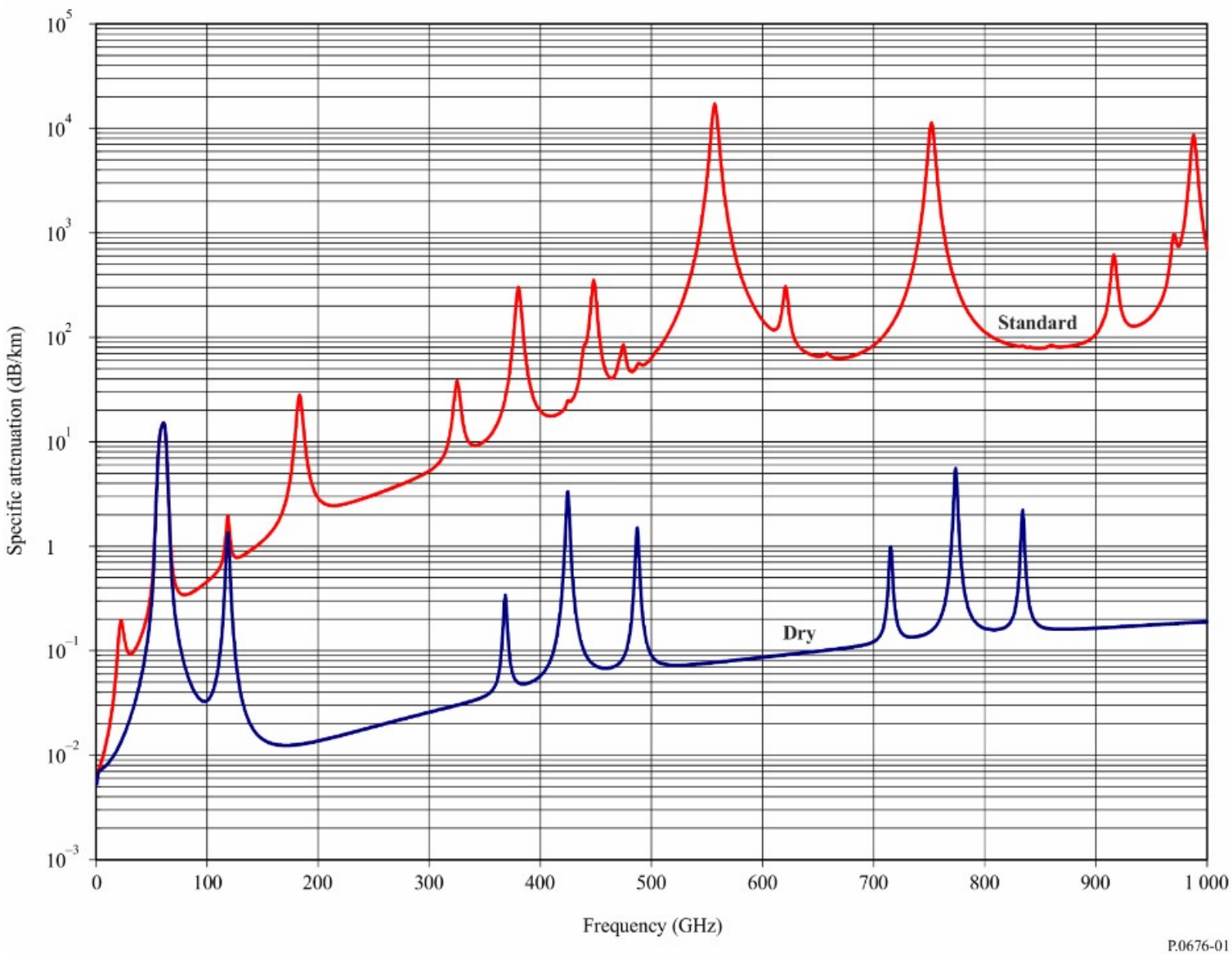

Figure: Atmospheric attenuation

Why 58GHz?

Around this frequency signal propagation is effected by oxygen molecule in the air. This phenomenon is called oxygen attenuation. Because such phenomenon, signal can not propagate for long distance.

Frequency reuse

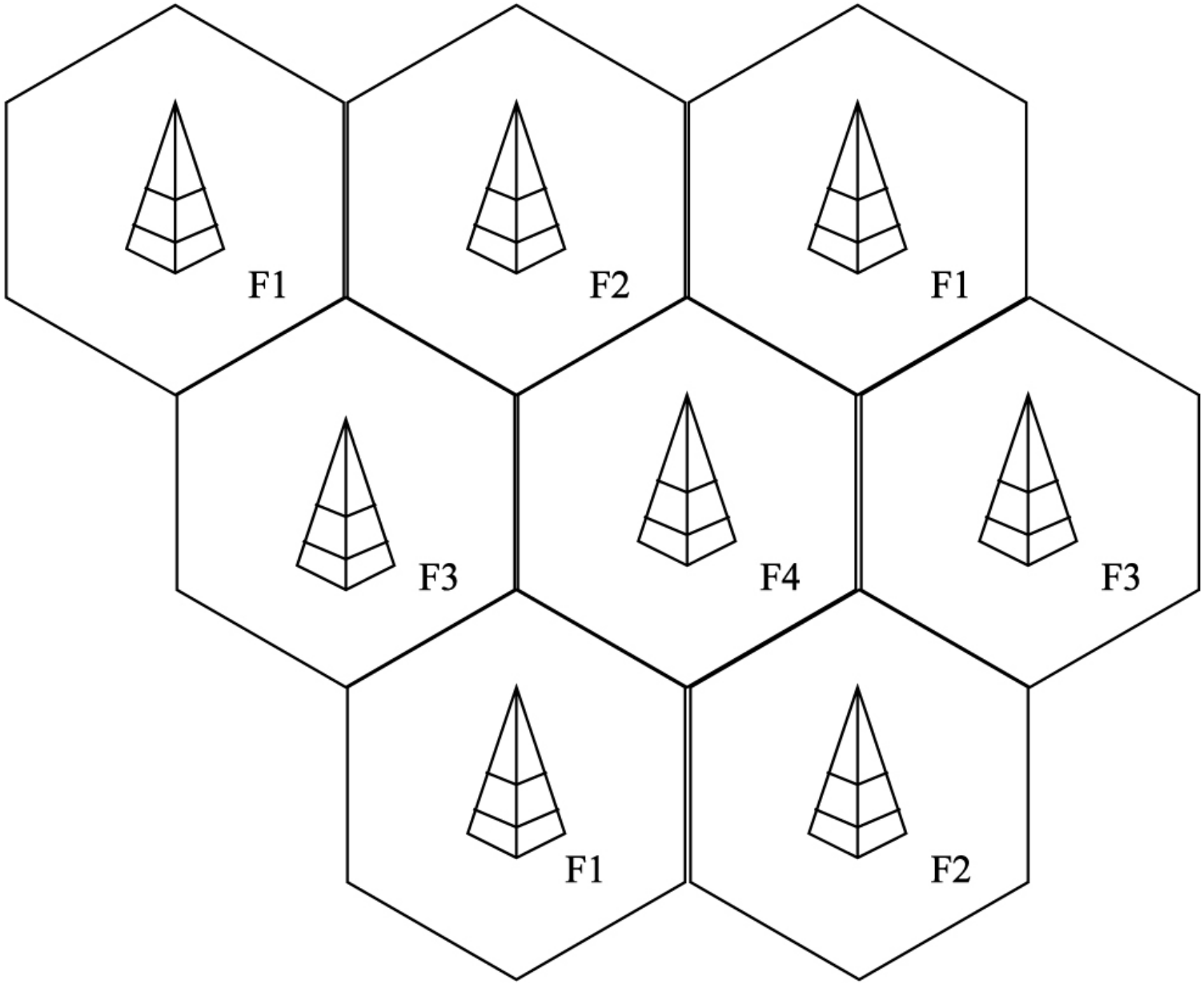

Figure: Cellular Network

Measurement setup

Two outdoor units are installed on the roof of both building V1 and building E. A computer connected to an indoor unit is logging the signal level every 10 second.

Data processing

All measurement data are stored in Oracle Cloud database. I made a python application for collecting and uploading the data to the cloud. And a webapp which can make data visualisation within a given time range.
Webapp: `http://152.70.177.227:8080/`