



University
of Pardubice
Faculty
of Electrical Engineering
and Informatics

Meteoradar simulator with frequency-modulated pulses

Lubos Rejtek

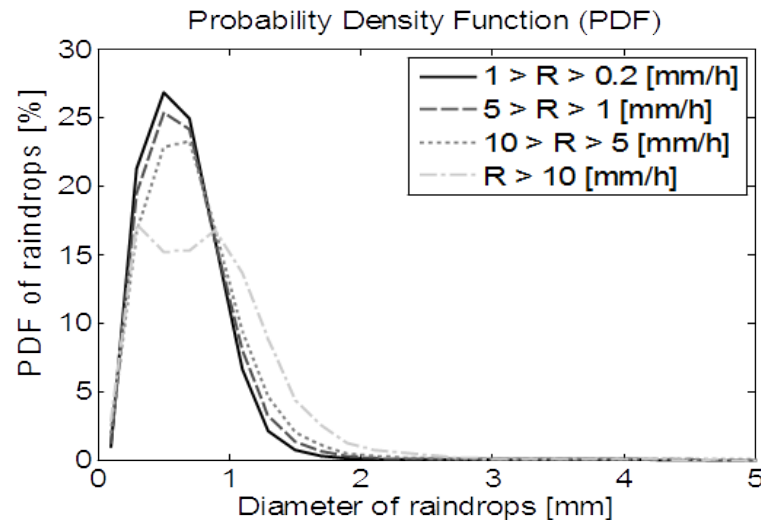
INTRODUCTION

- The primary goal of the project is to create a simulator of the weather radar signals.
- The simulator is to use for test of data processing methods.
- The benefits of the simulator are to use defined signals for testing and obtaining of specified signal without waiting to real measurement.
- This simulator is complementary system to real weather radar.
- Owner of this real weather radar is the Institute of Atmospheric Physics Academy of Sciences of the Czech Republic. Station of radar is in this picture.



OBJECTIVES

- The first aim of the project is to analyze characteristics of the meteorological targets.
- The second aim of the project is to analyze characteristics of the real weather radar.
- The third part is to draw up equations for calculation of signals.
- The fourth part is to creation of the simulator.



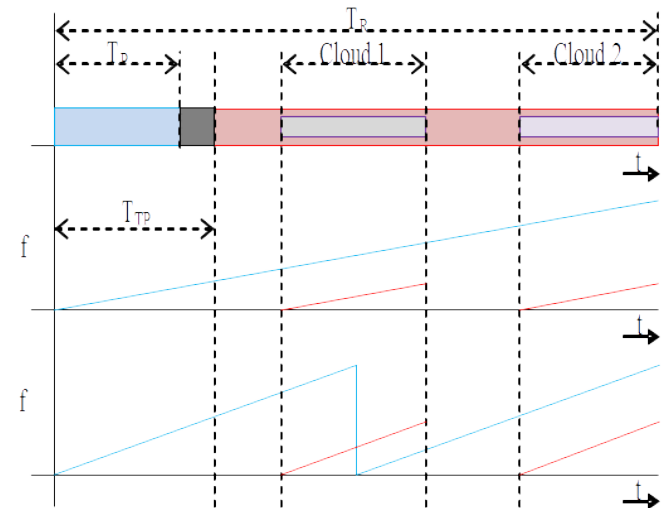
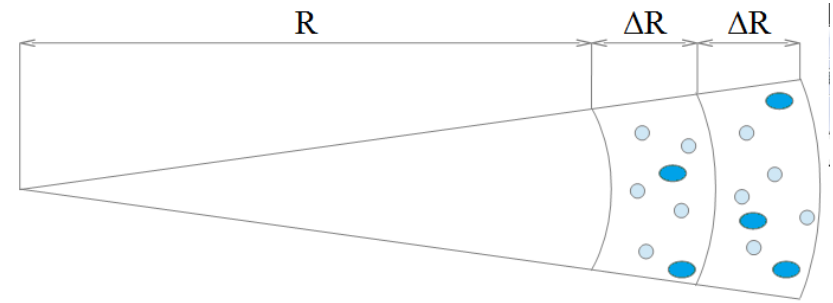
MATERIAL & METHOD

- Picture of the antenna and mm part of the radar is shown in this picture.
- This radar is pulse radar with frequency modulated pulses.
- Doppler frequency of signal reflected from raindrops are to compute by the using of Gunn-Kintzer model.



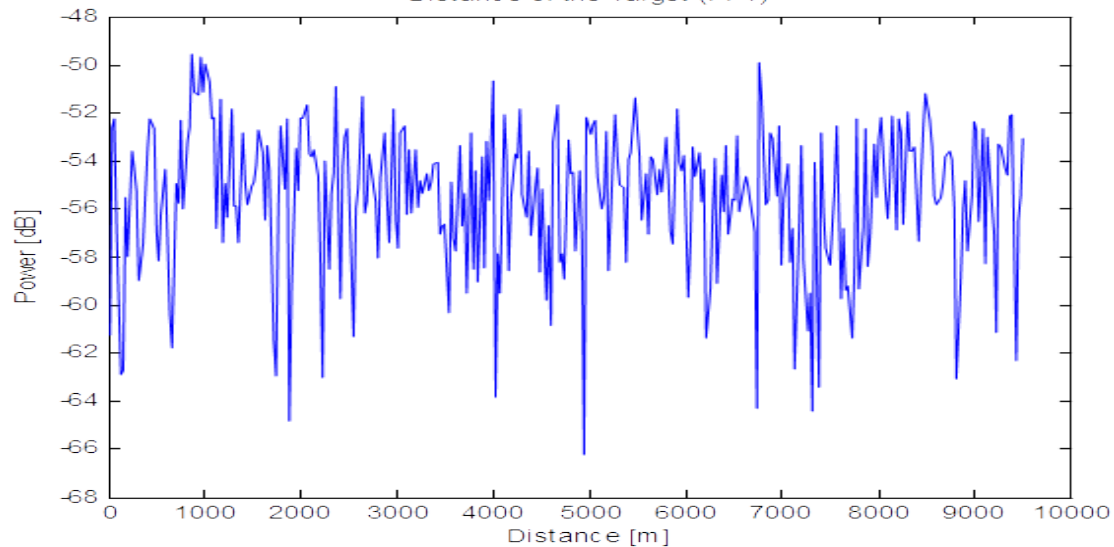
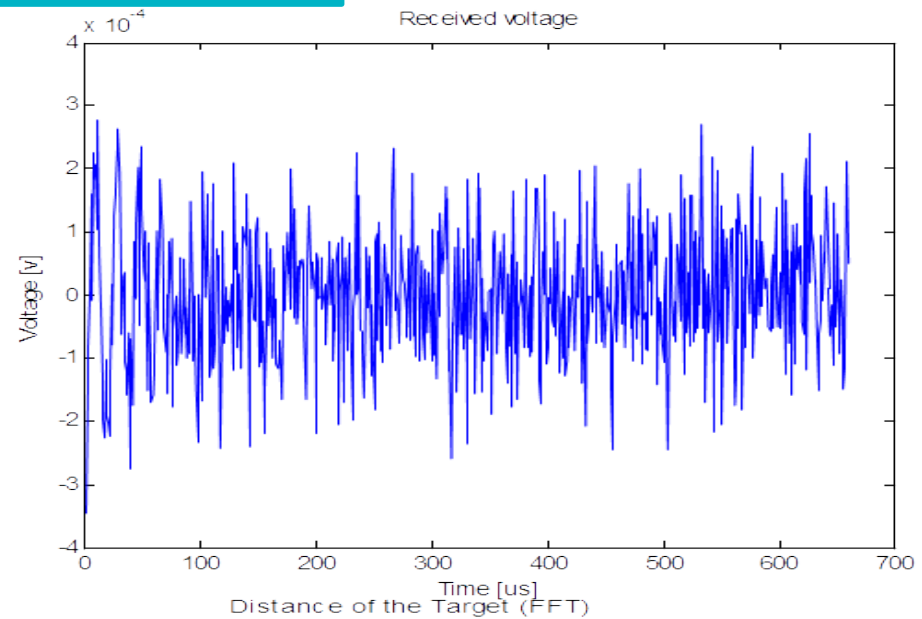
MATERIAL & METHOD

- In the top picture there are shown segmentation of calculations according to diameters and according to ranges. Dark blue raindrops are with bigger diameters and light blue raindrops are with smaller diameters.
- Examples of two sweeping modes are shown in the button picture.
- Simulator is programmed by the using of development tool Matlab.



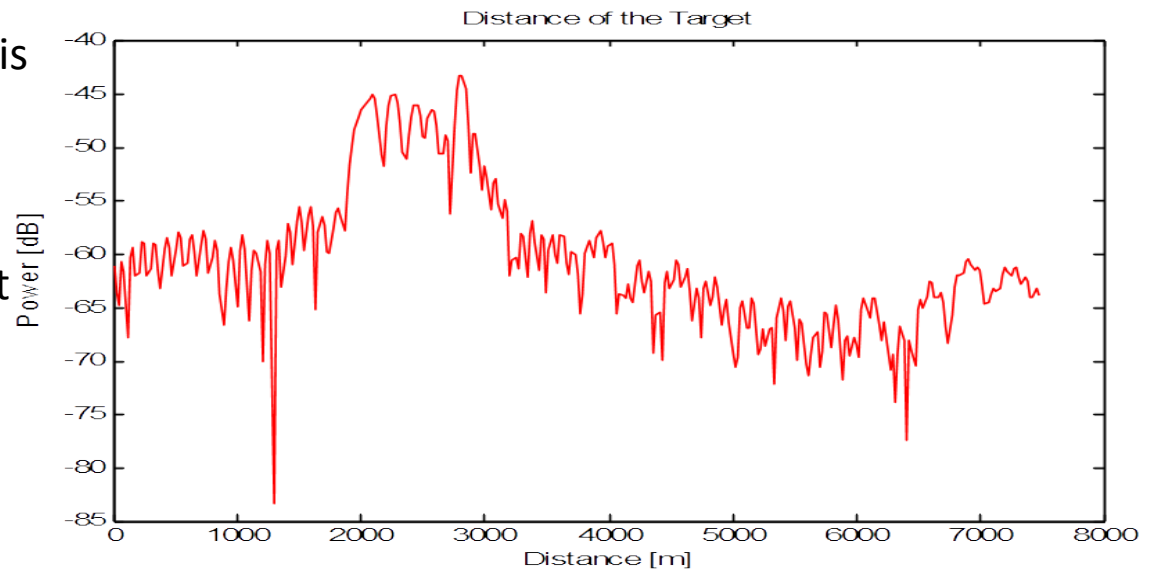
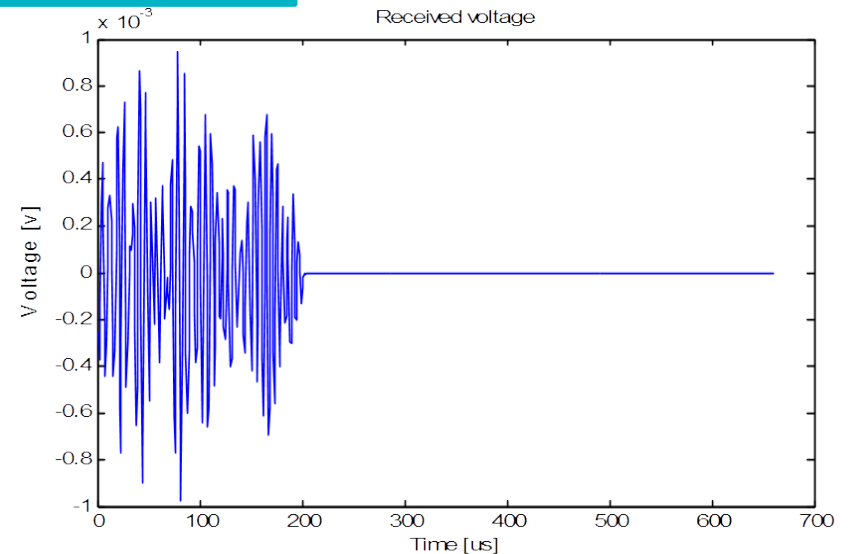
RESULTS

- An example of the noisy target is shown on the top graph.
- The Fast Fourier Transformation of this signal is shown on the bottom graph.
- Signal noise ratio is equal 6 dB.
- Target distance is 1000 meters.



RESULTS

- An example of the long target is shown on the top graph.
- The Fast Fourier Transformation of this signal is shown on the bottom graph.
- Target distance is 2 km and his length is 1 km.
- This signals can be to use to test AR models, periodograms and others methods.

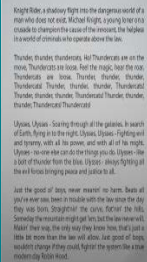


ACKNOWLEDGEMENT & CONTACT

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Knight Rider, a thrilling fight into the dangerous world of a
man who does not exist. Michael Knight, a young boy on a
quest to change the world of the innocent, the helpless
to a world of criminals who operate above the law.

Thunder, thunder, thunder, All Thunderers are on the
move, Thunderers are here, feel the rage, hear the roar,
Thunderers are here, Thunder, thunder, thunder,
Thunderous! Thunder, thunder, thunder, Thunderous!
Thunder, thunder, thunder, Thunderous! Thunder, thunder,
Thunder, Thunderous!

Uppas, Uppas, Soaring through all the galaxies, in search
of Earth, flying in the night, Uppas, Uppas, Fighting and
winning, with all its power, and with all its might,
Uppas, no-one else can do for things you do, Uppas, the
light of thunder from the blue, Uppas, always fighting of
the evil forces bringing peace and justice to all.

Just the kind of love, when married no more, because
you've never been in trouble with the law since the day
they were born, Stay together, the courts, for the hell,
Somebody has to stand up for the law, the law will
stand, that way, the way they know how, that's just a
line of more than the law will allow, the kind of love,
couldn't change if they could, fight for the open like a true
modern day Robin Hood.