Lab2
Understanding LoRa modulation

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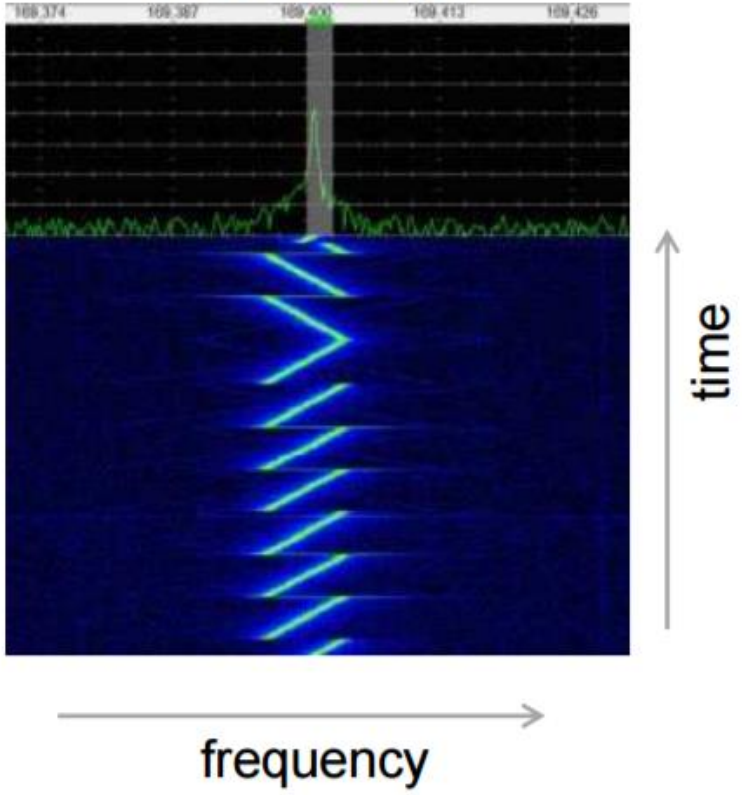
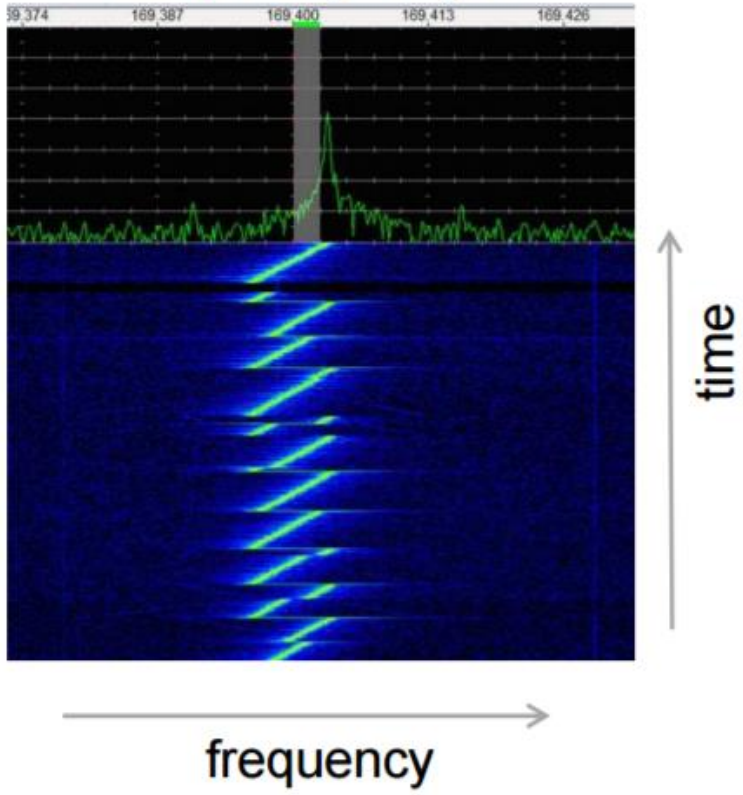
LoRa modulation is based on CSS

- You are going to visualize the spectrogram of the LoRa modulation
- We are using blade RF SDR with 4MHz bandwidth
- Each group must choose a different frequency

LoRa pre-amble signal:
10 symbols or “chirps”,
2 reverse “chirp”.



LoRa data signal:
A symbol is a “chirp” with a frequency “hop”.



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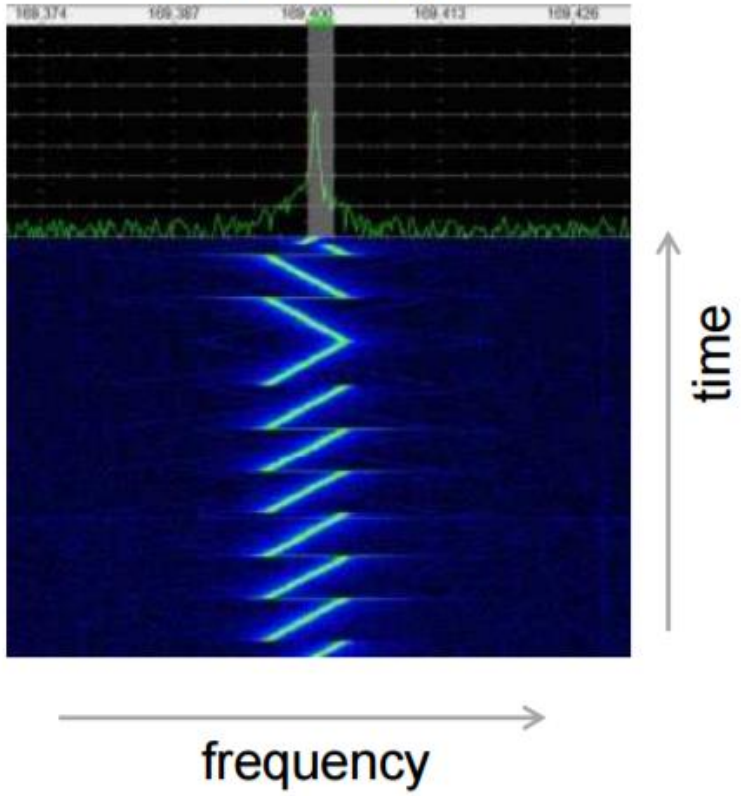

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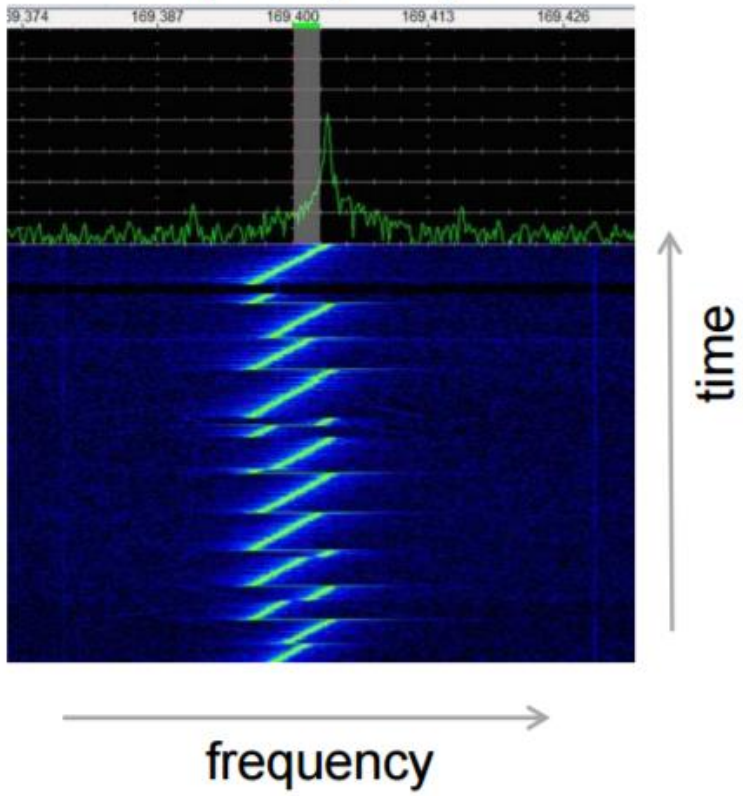

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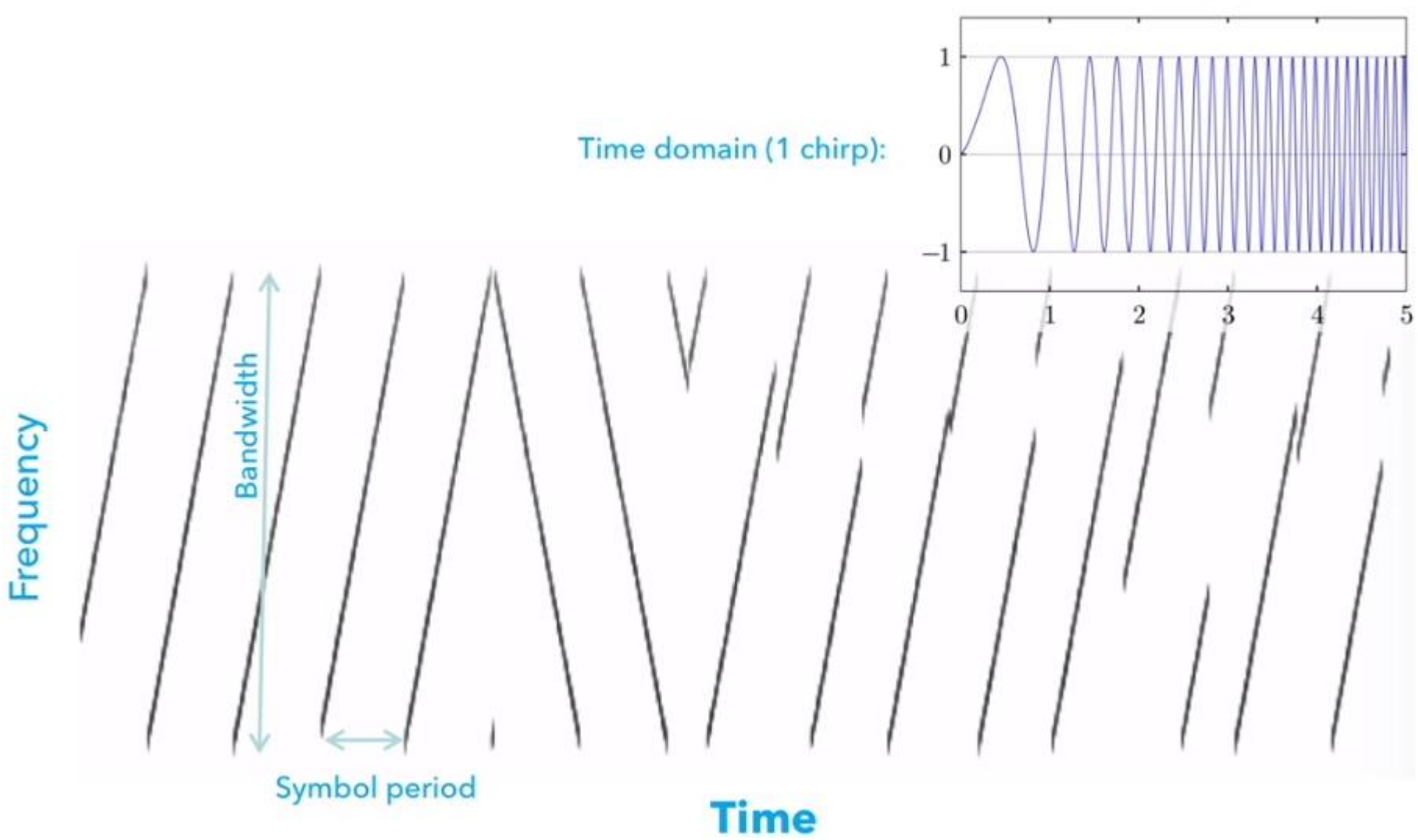

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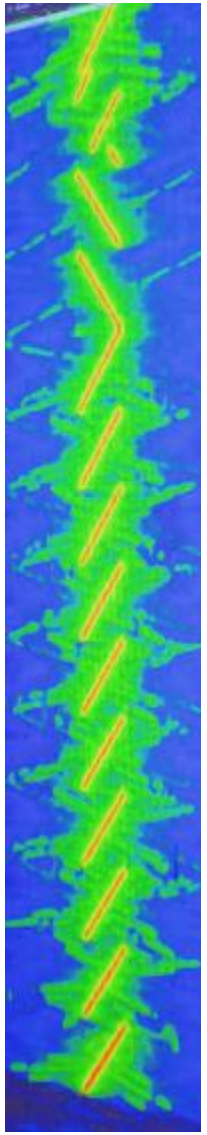
- Download the code LoraPHY.ino in UCA_Board/Arduino_Code/LoRa_PHY/LoRaSender_Phy.ino
- You can tune the :
  - SF : from 7 to 12
  - BW : from 7.8KHz to 500KHz
  - N° of Peamble from 6 to 65535, yielding total preamble lengths of 6+4 to 65535+4 symbols, once the fixed overhead of the preamble data is considered.
  - Payload
- Upload the code in the board
- Watch the Spectrogram and explain the effect of the different parameters on the signal



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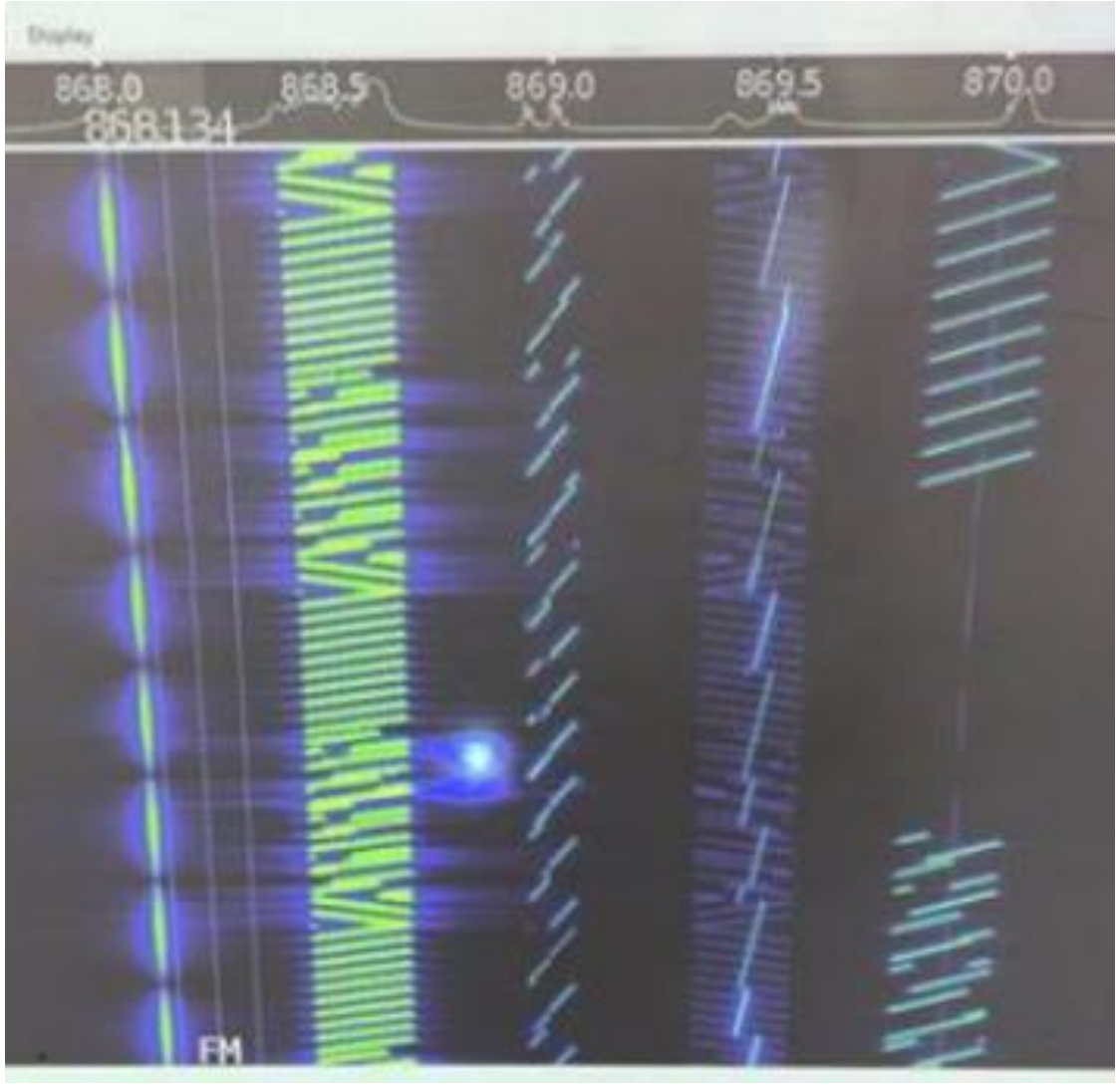
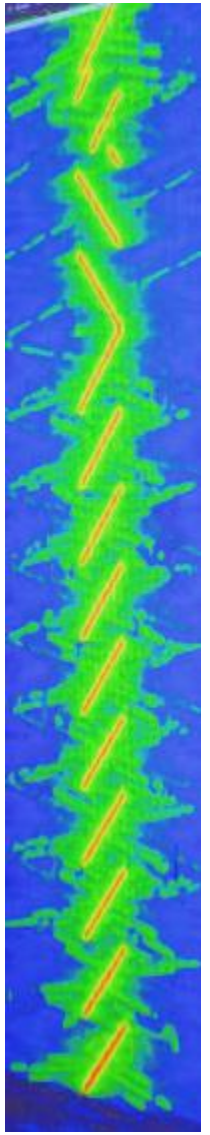
- What you should observe
  - Different slopes
  - Different bandwidth
  - Identify the preamble and the data part





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- Have also a look tp this application :

- LoRa Calculator :

https://www.semtech.com/products/wireless-rf/lora-transceivers/SX1276#download-resources