

Interfering signals and attenuation – potential problems with communication via the power grid

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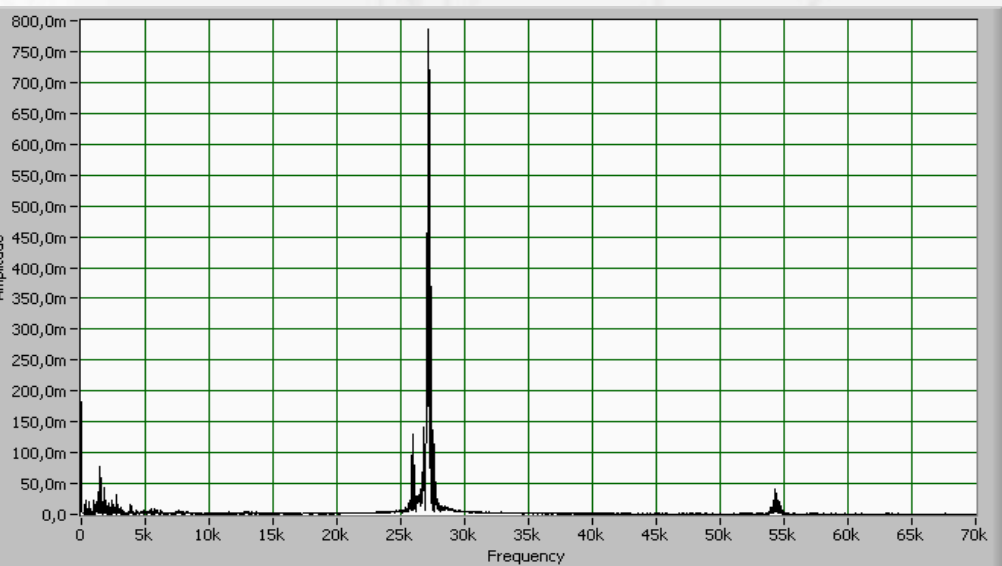
²Skellefteå Kraft Elnät AB

³STRI AB

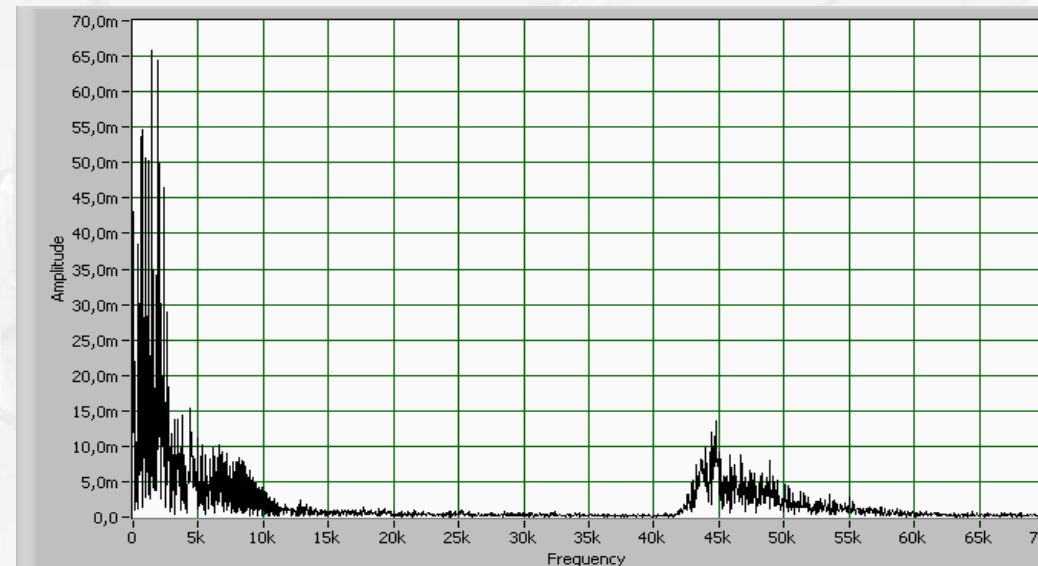
Three potential problems

- Signals interfering with the communication
- The communication is attenuated
- The communication becomes an interfering signal

Interfering signals or noise



UPS

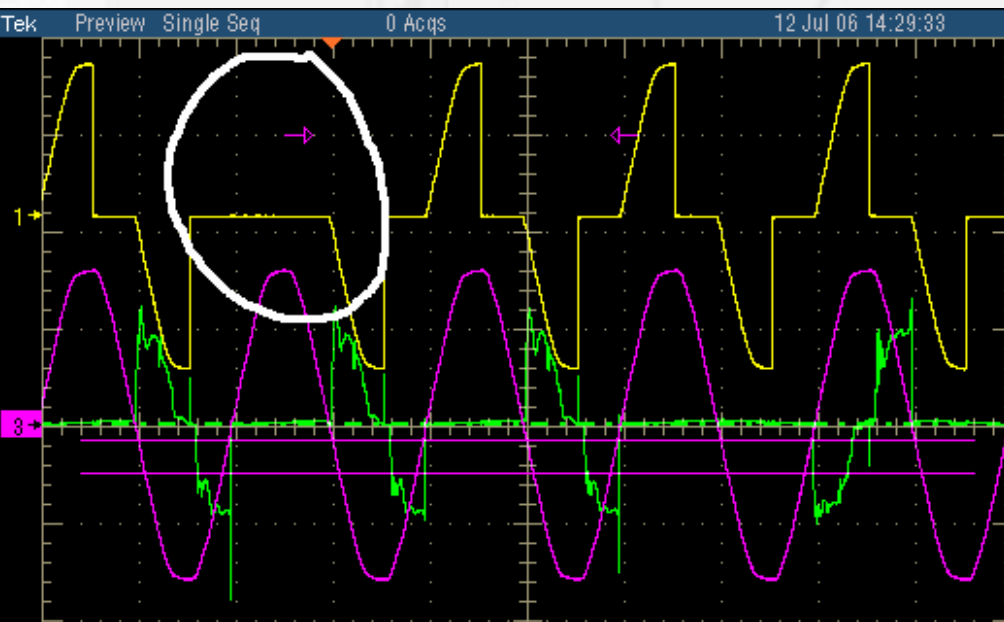


High-frequency fluorescent lamp

Attenuation

- Feeding transformer
- Impedance of the power grid
- Loads and mainly their EMC filters

The communication becomes an interfering signal



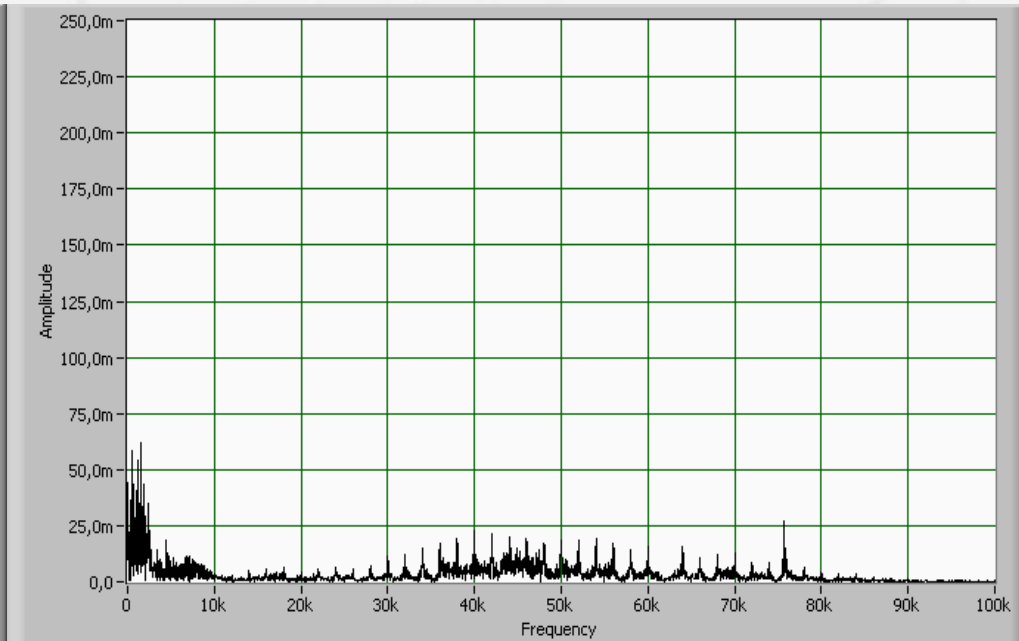
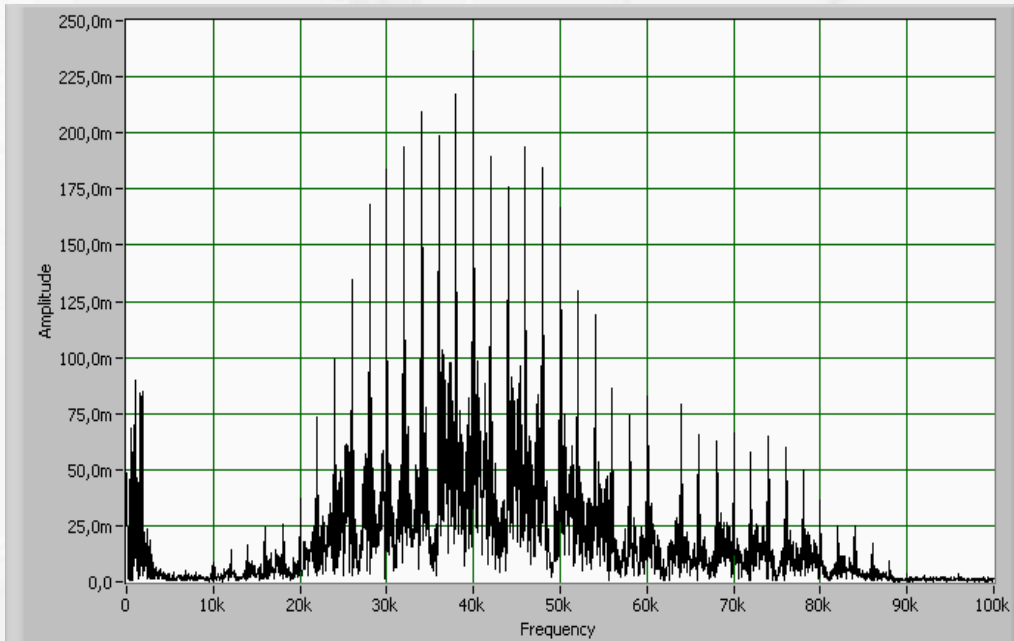
Oscillation around the zero crossing



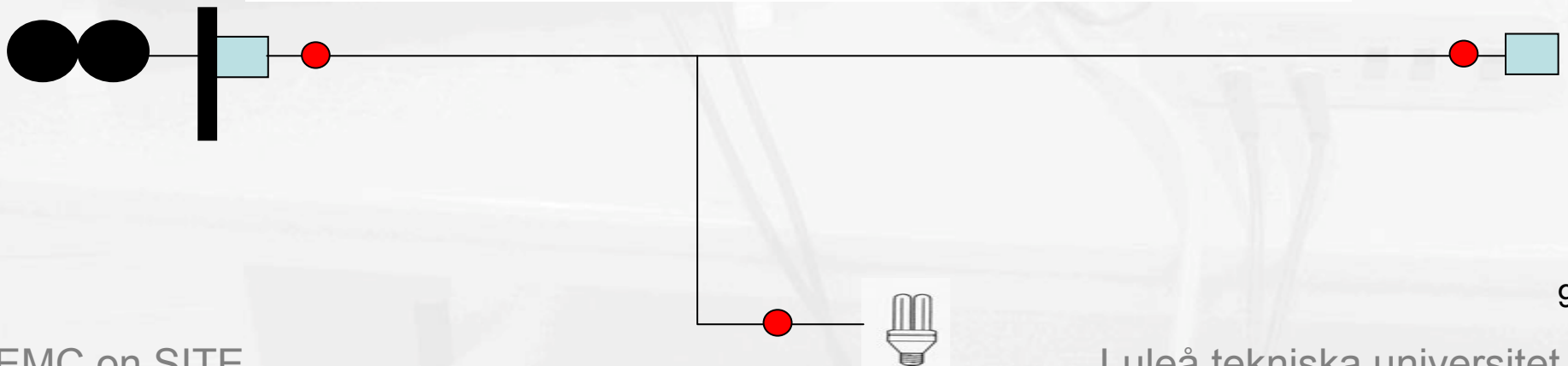
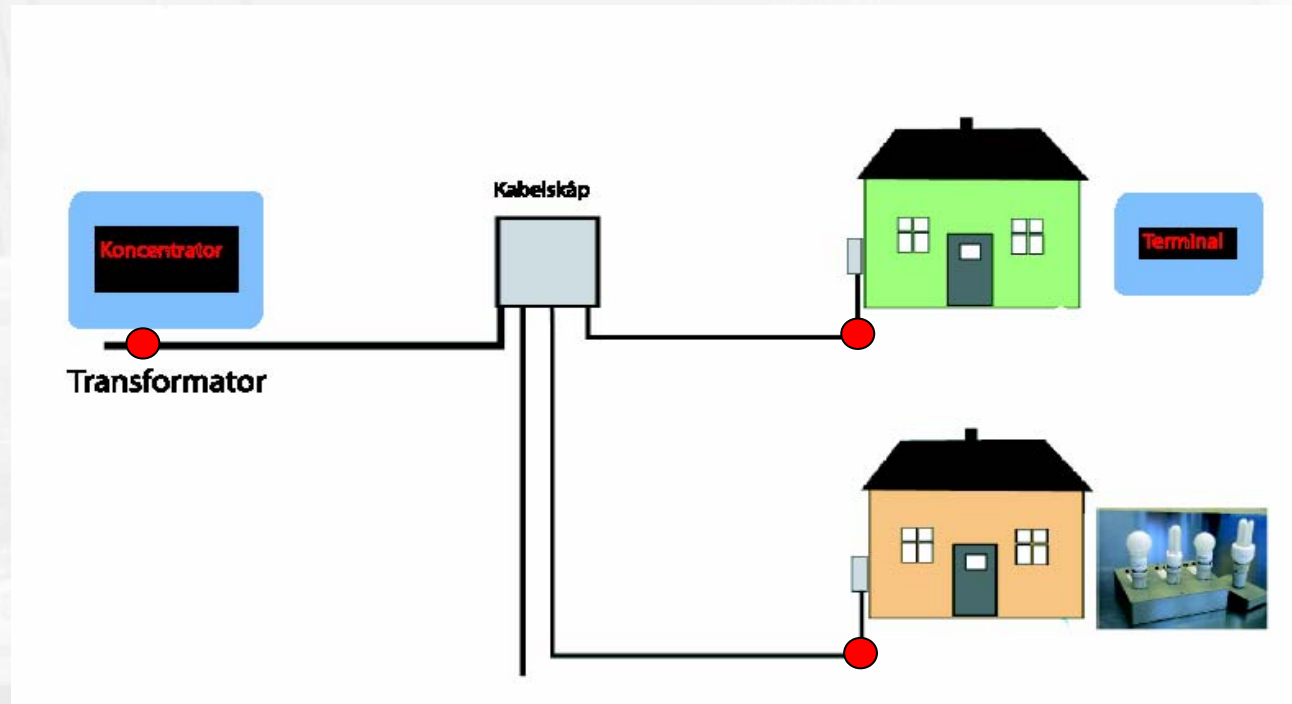
Measurements

Pehr Högström Laboratoriet
EMC on SITE

Attenuation

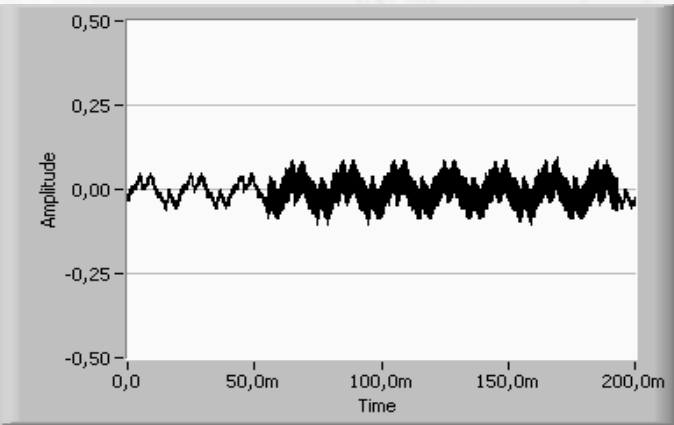


Test setup

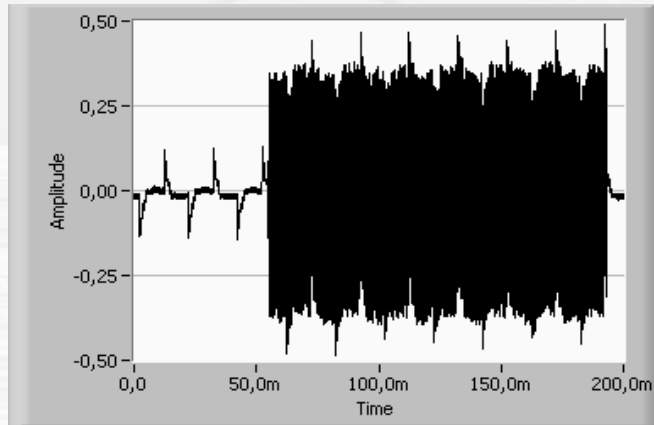


Energy-saving lamp

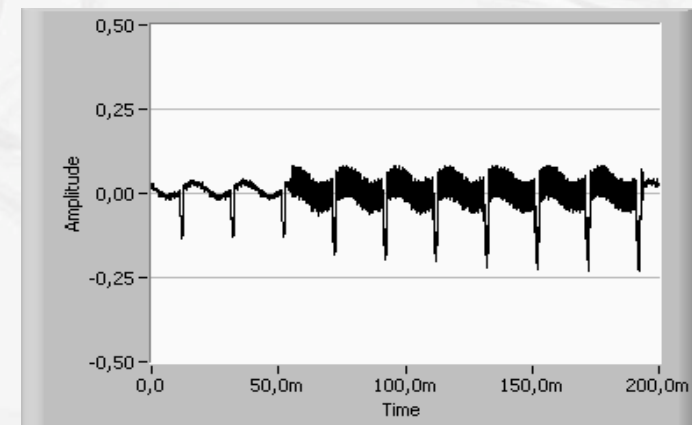
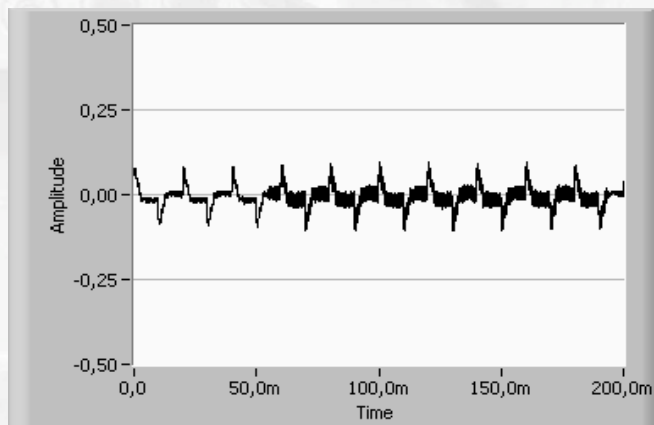
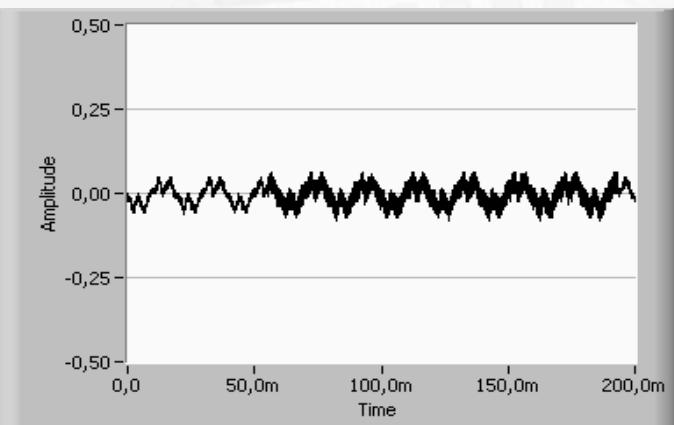
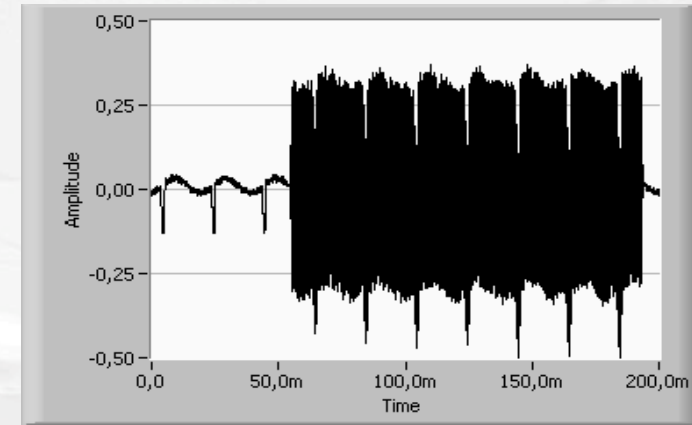
Concentrator



Energy-saving lamp

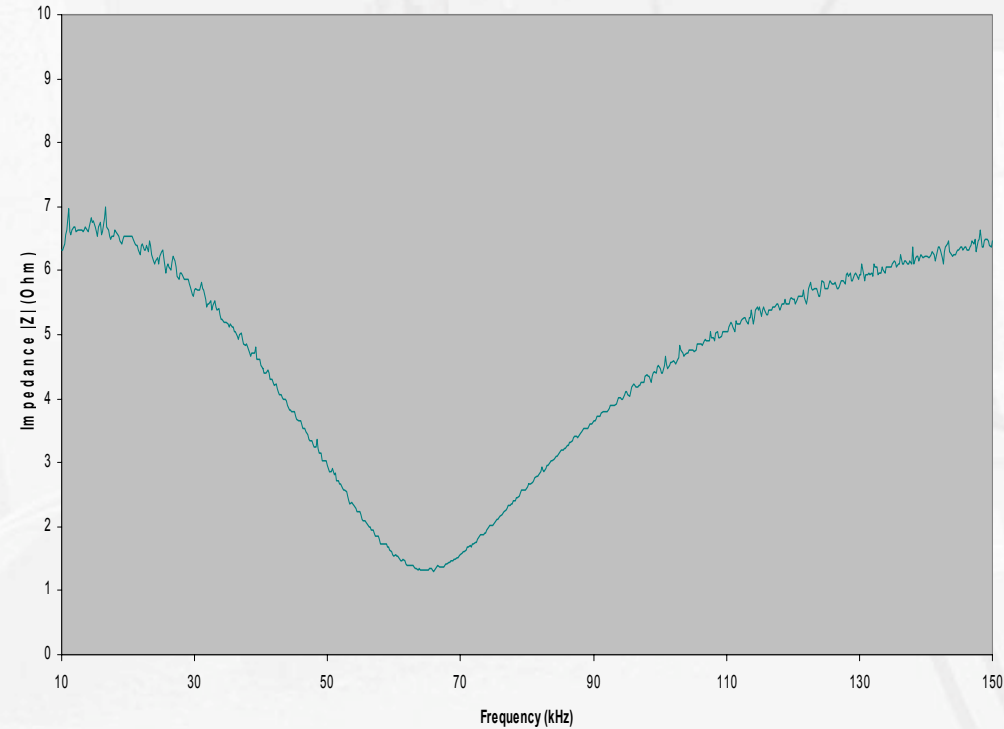


Power Meter transceiver

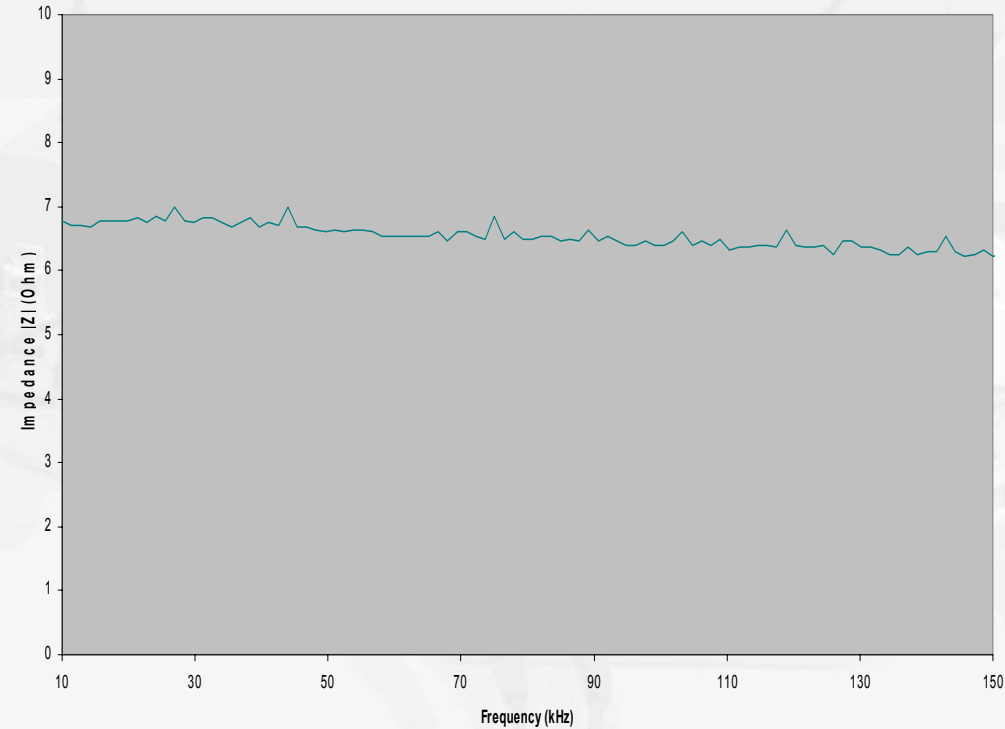


Impedance of energy-saving lamp

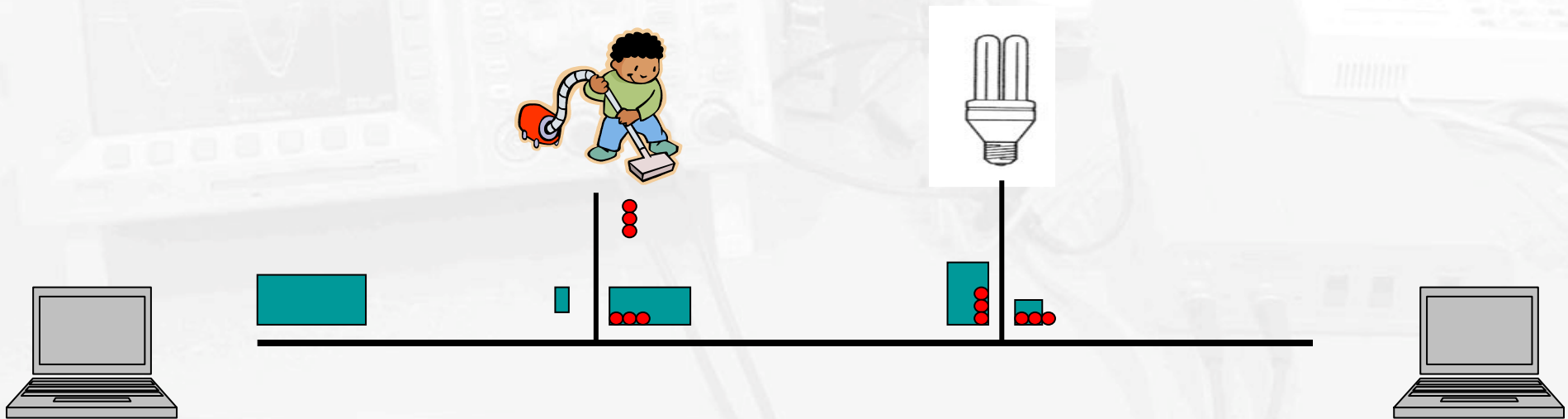
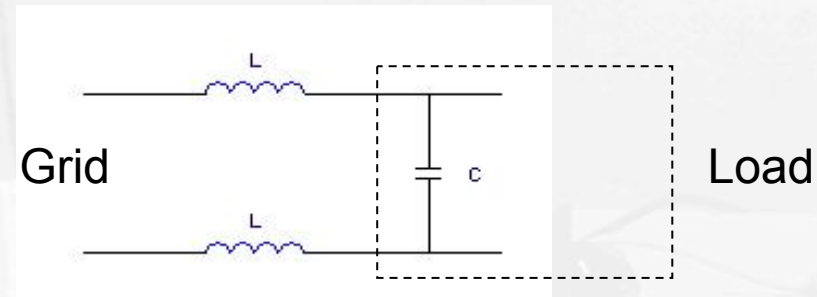
Impedance of low-energy lamp



Impedance of low-energy lamp MD8D 4W 12/03

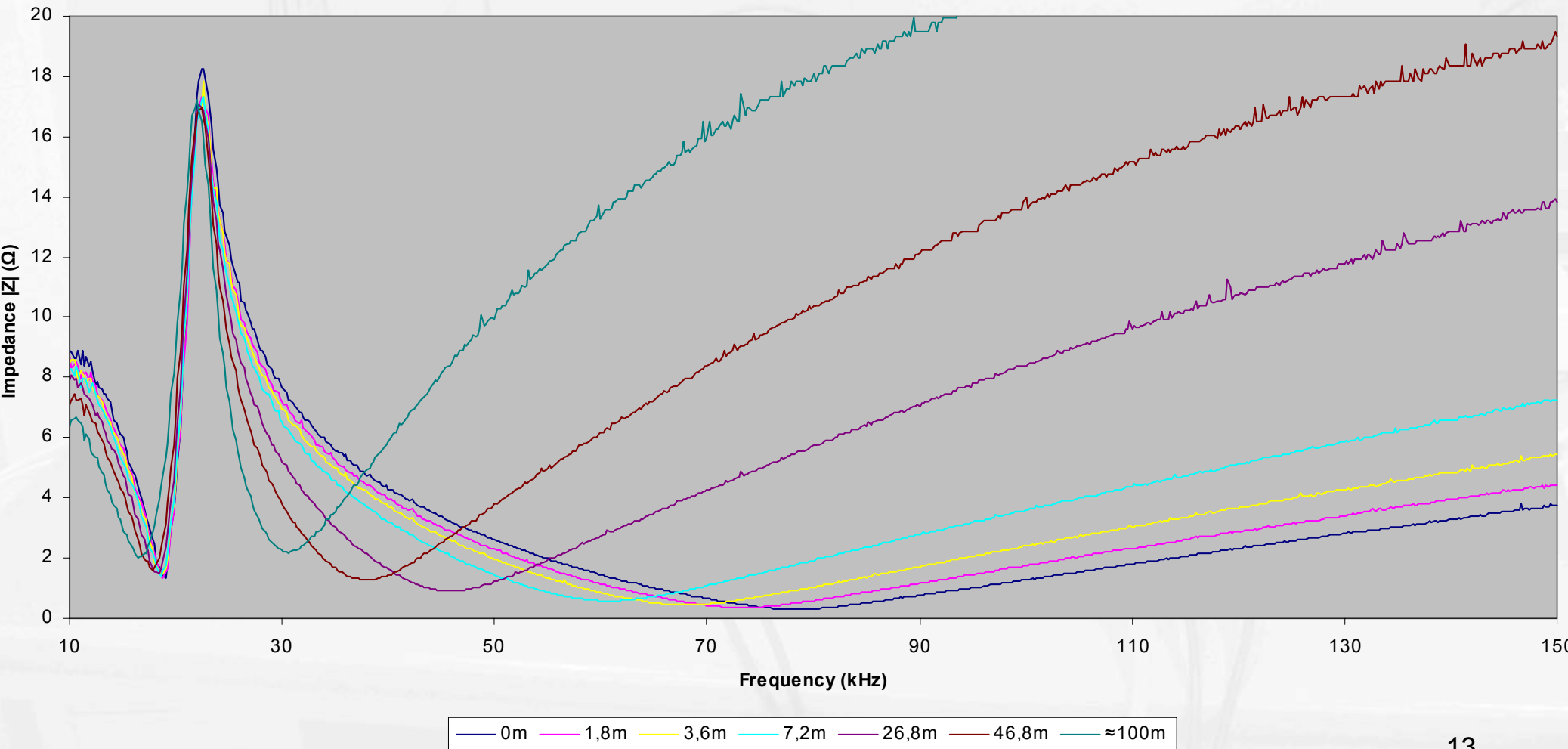


Loads working like a shunt

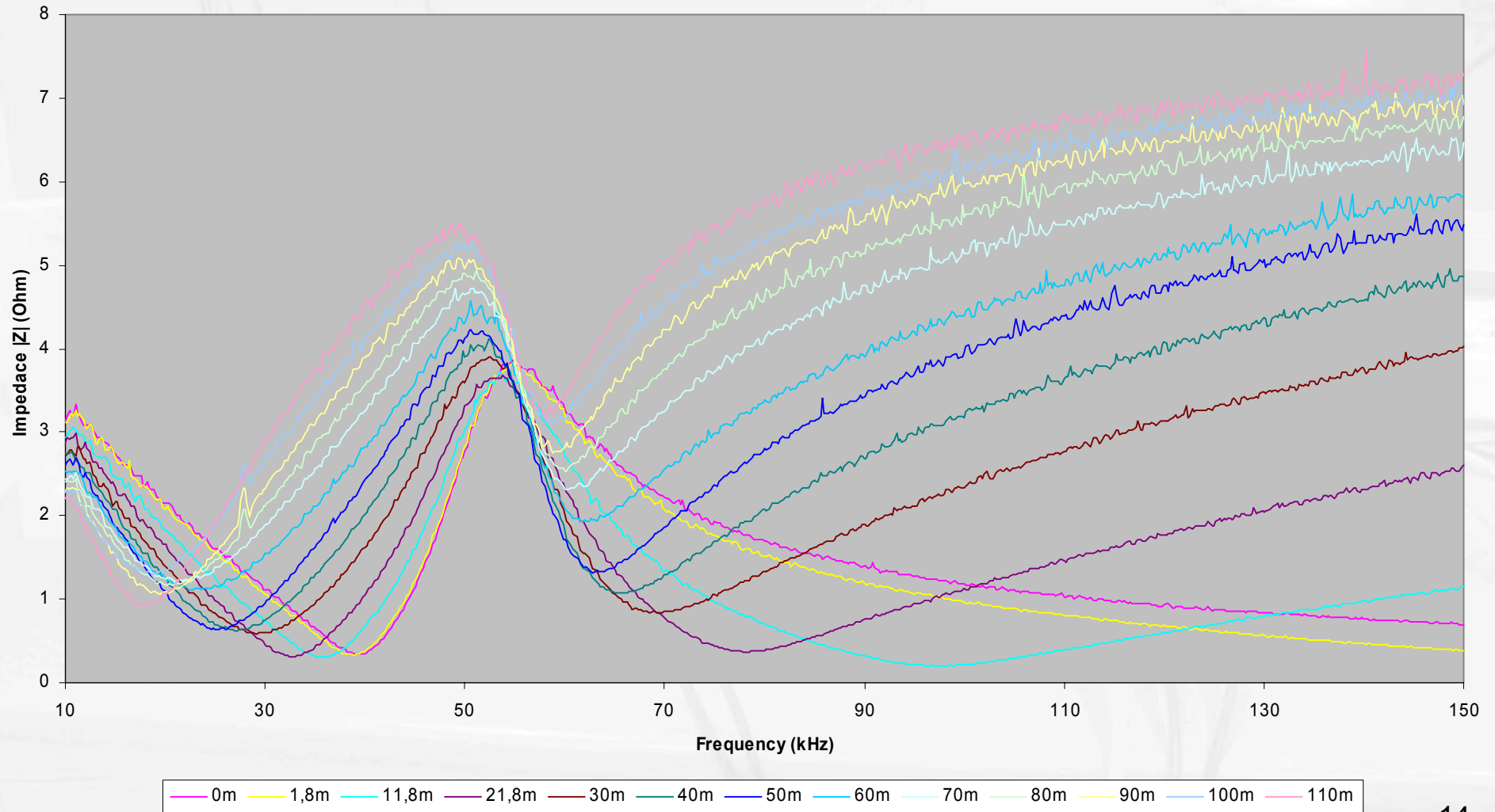


Printer

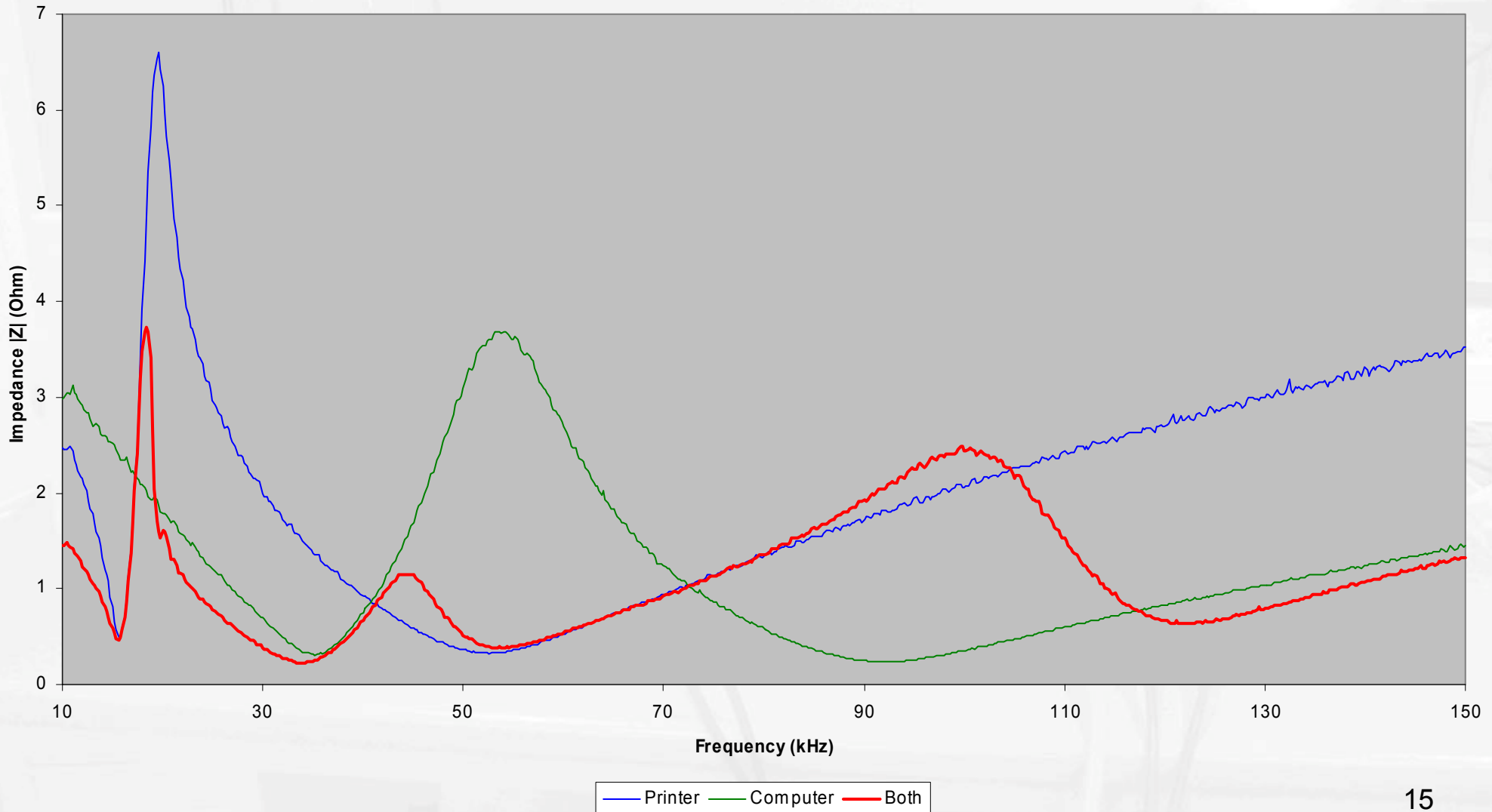
Impedance of printer

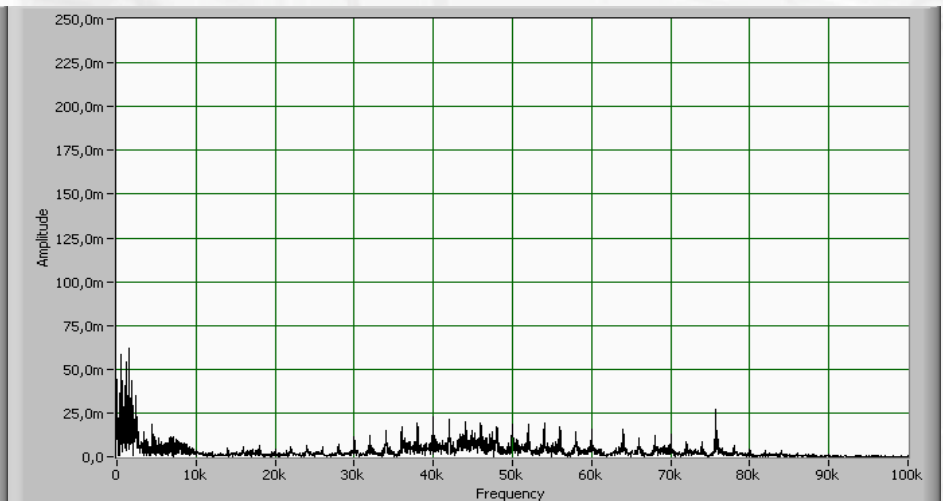
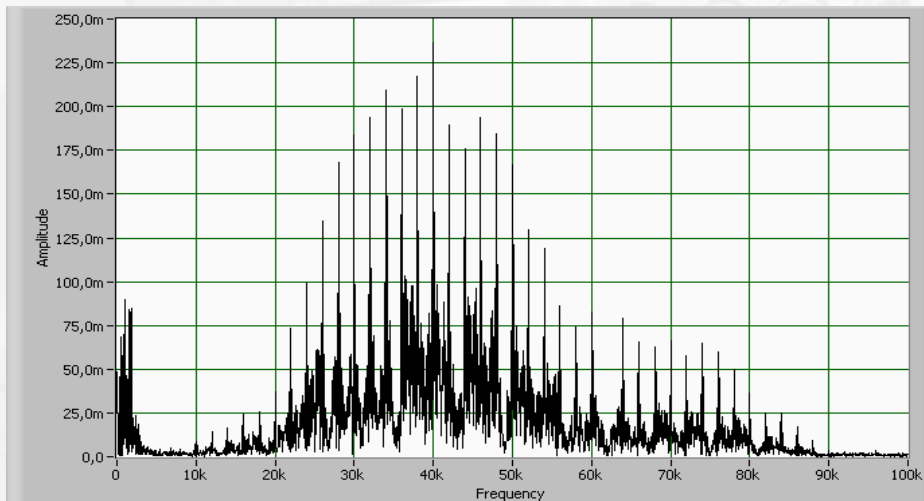
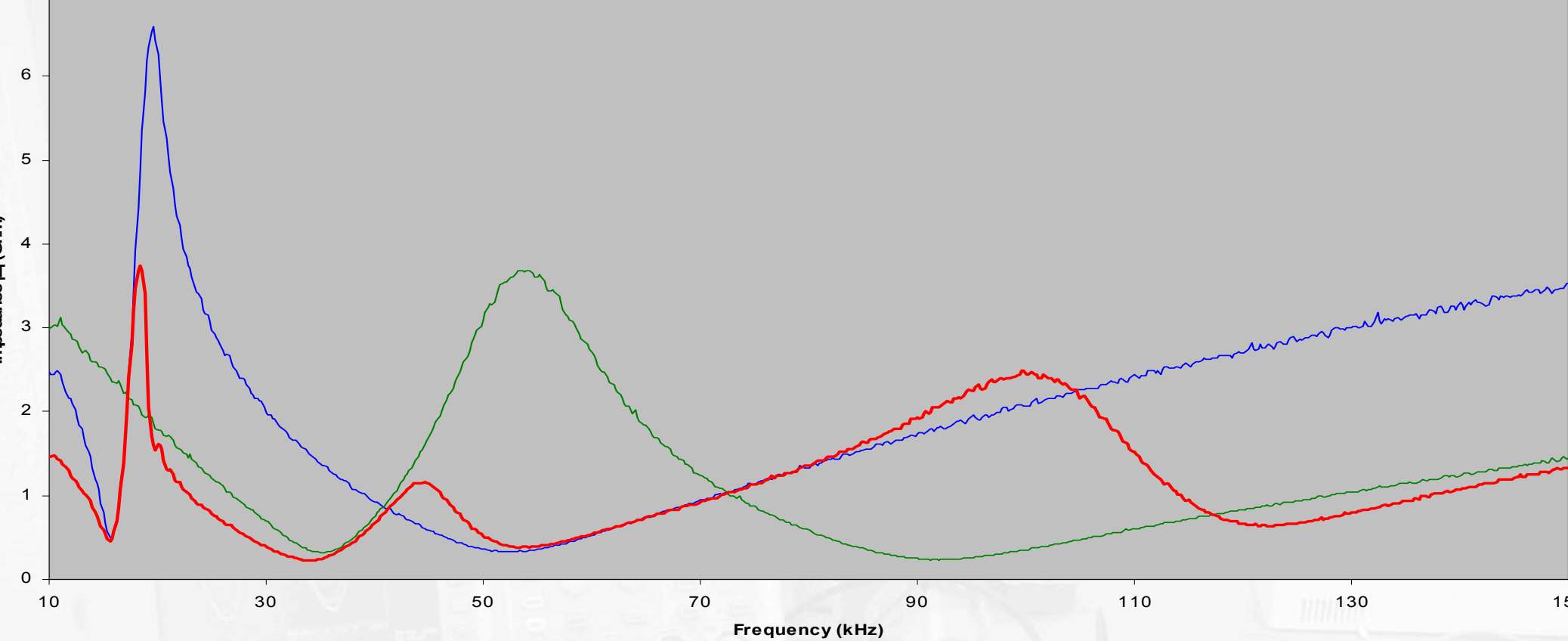


Computer



Computer & printer





Conclusion

- With the increasing use of energy-saving equipment, the magnitude of signals in the communication channel increases
- Interfering signals can be reduced by using filters
- The use of filters will lead to attenuation
- The way that EMC-filters are designed today and the way that we want to use the power grid for communication are not compatible

Thanks

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