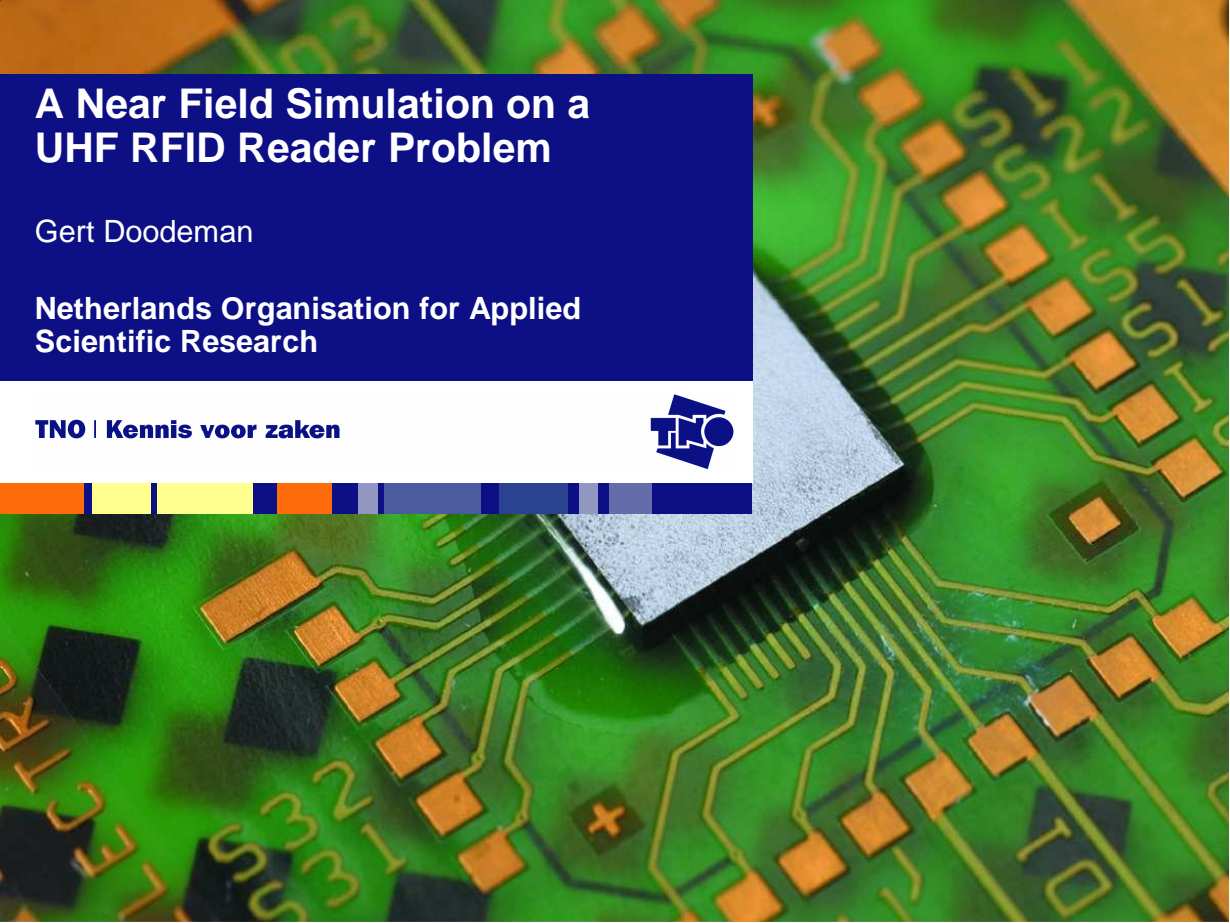


A Near Field Simulation on a UHF RFID Reader Problem

Gert Doodeman

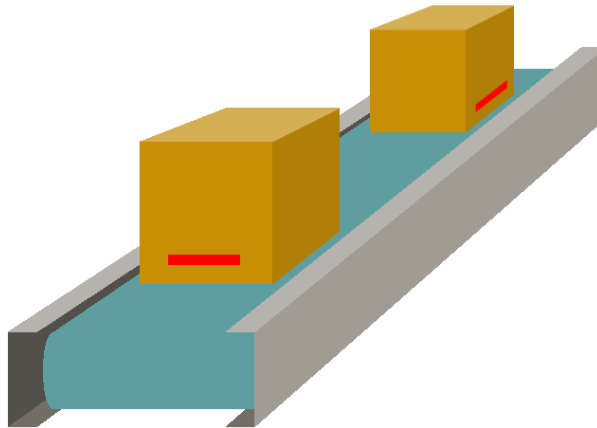
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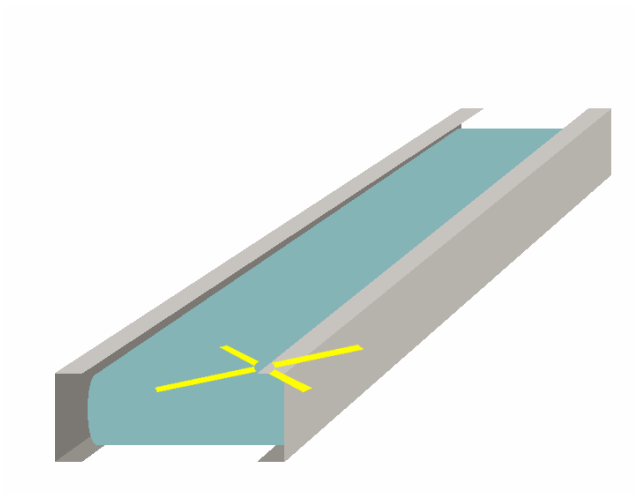
The conveyor belt problem

A conveyor belt with parcels, equipped with an UHF RFID reader directly under the belt

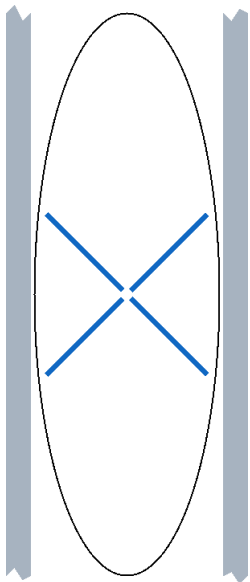


The conveyor belt problem (2)

The antenna is e.g. a cross dipole or a circular polarized patch.

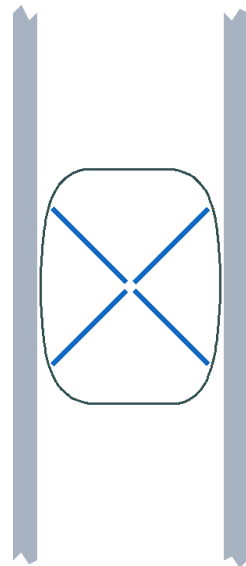


The conveyor belt problem (3)



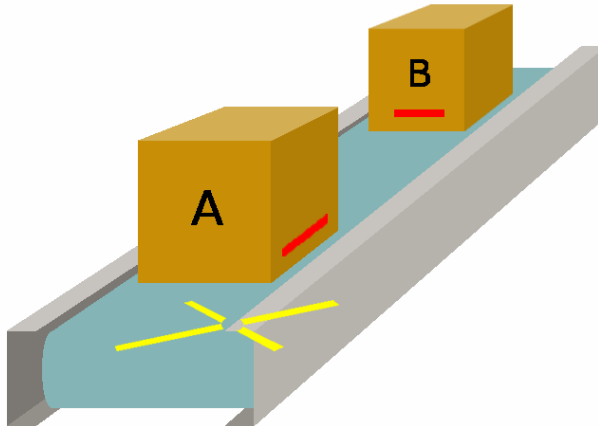
The antenna is circular polarized. Due to the metal of the conveyor belt, the antenna polarisation is oval.

With a phase correction, nearly circular polarization should be recovered.



The conveyor belt problem (4)

Sometimes parcel B is recognized while parcel A should be readed by the antenna.



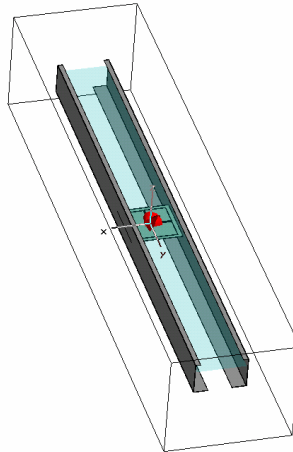
The conveyor belt problem (5)

Simple instruments can be very helpful



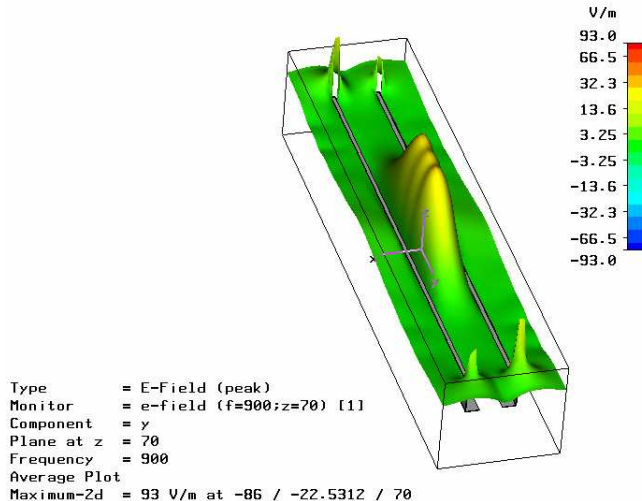
Understanding the problem (1)

- Part of the conveyor belt with antenna was simulated in CST.
- The E-field is calculated in both RFID-tag orientations.



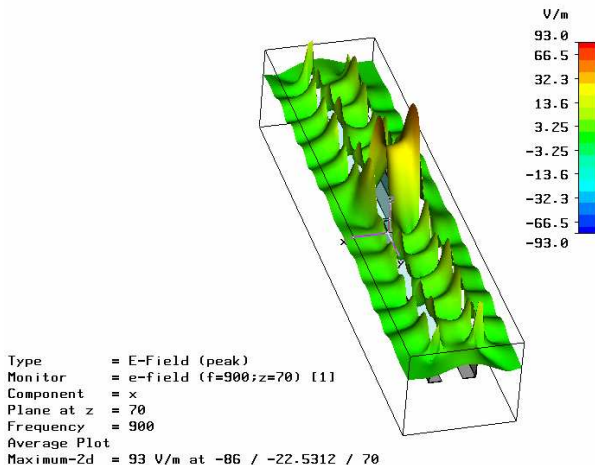
Understanding the problem (2)

The E-fields in the y-direction (the belt moving direction) has a nice field strength distribution



CST simulation (3)

The E-fields in the x-direction (perpendicular to the belt moving direction) propagates between the two metal side carriers.



The solution

- Understanding the problem
- Variable power level can not be avoided
- Placing Reflectors
- Placing Absorbers

Thanks to CST simulation software

