

# Tracing Granular Products using RFID

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# Tracing Granular Products using RFID

*Industrial partners and funding agents:*

Electrotech AB

LKAB

Vinnova

EU structural funds Mål 2

# Traceability

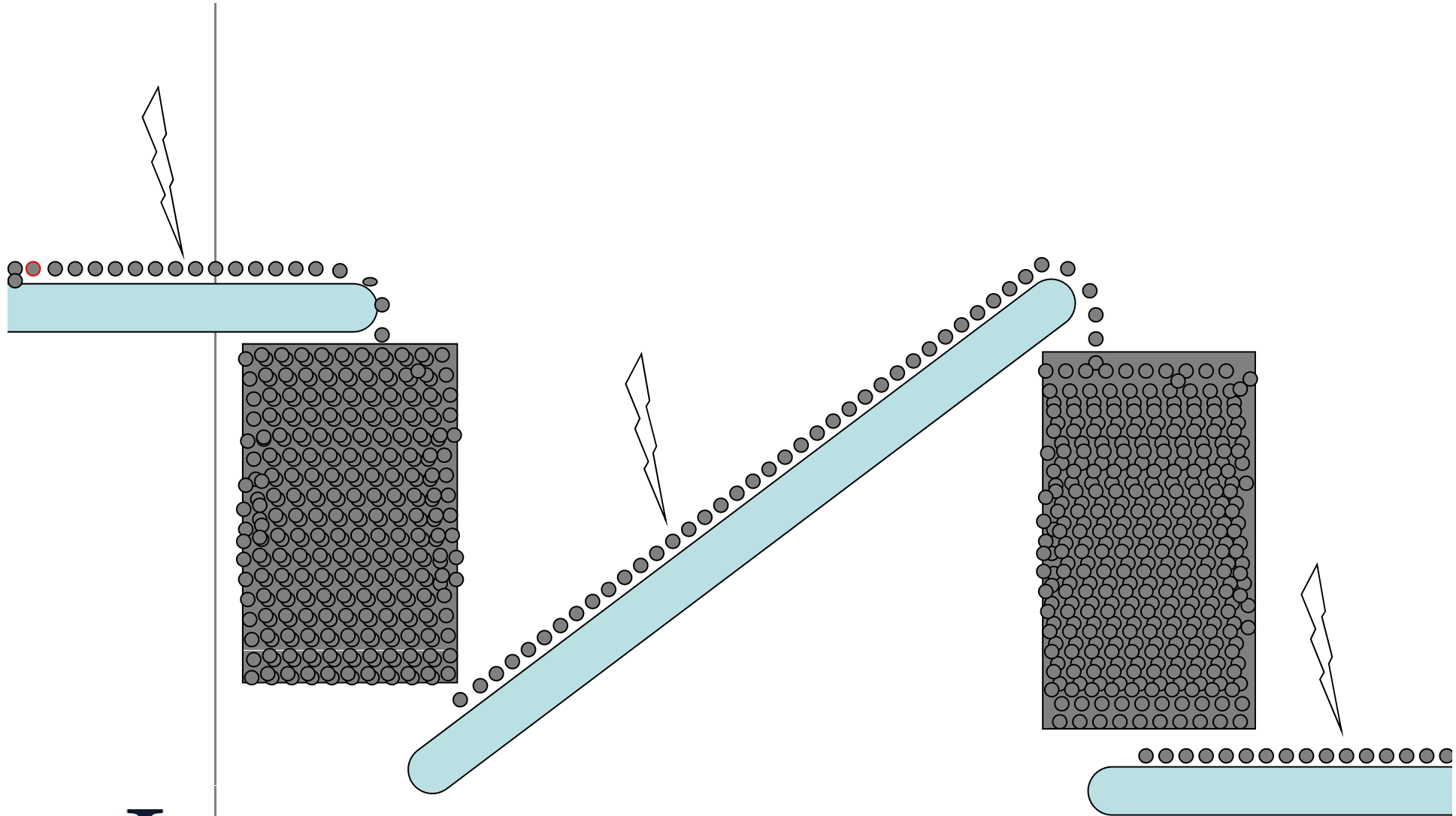


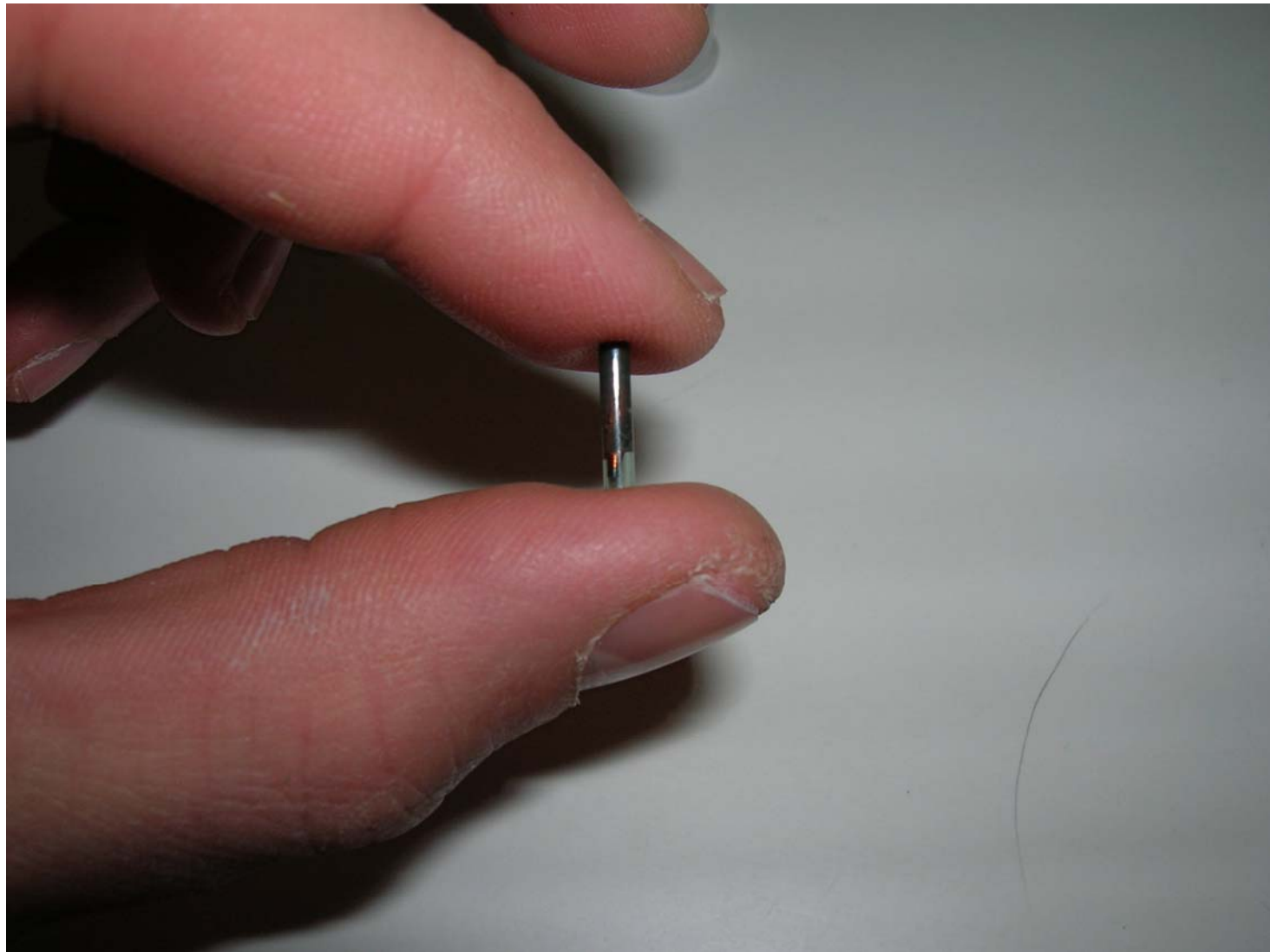
# Traceability of Granular



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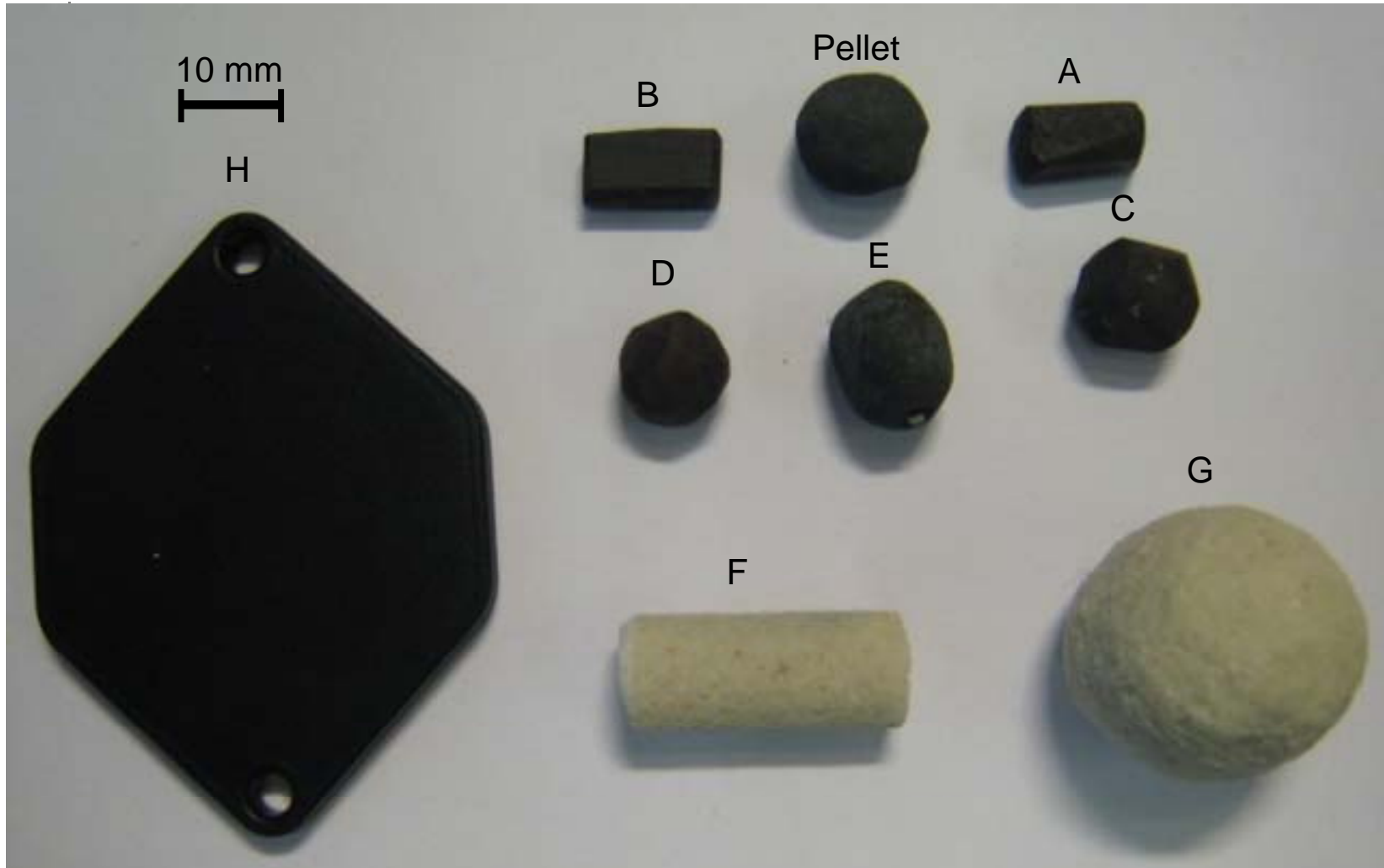


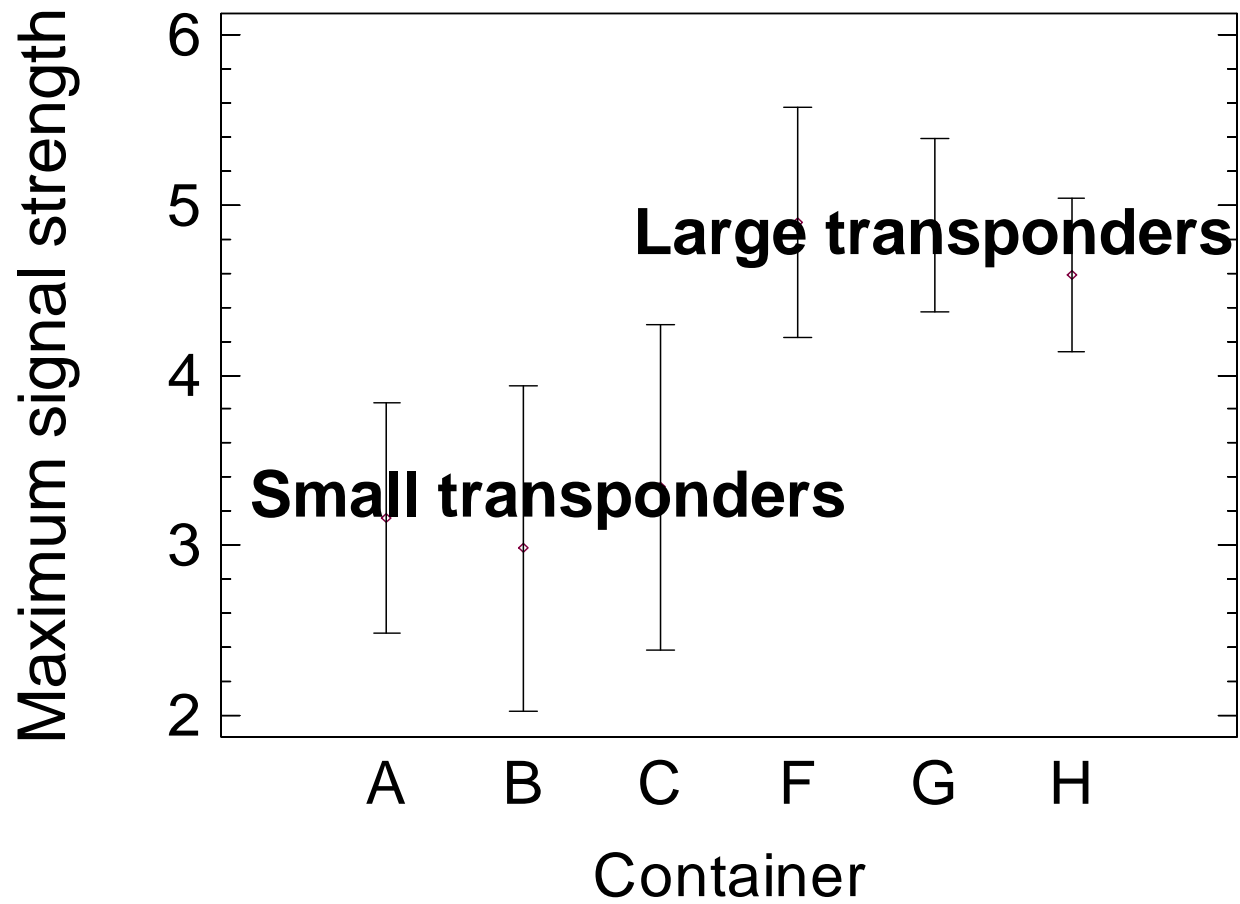


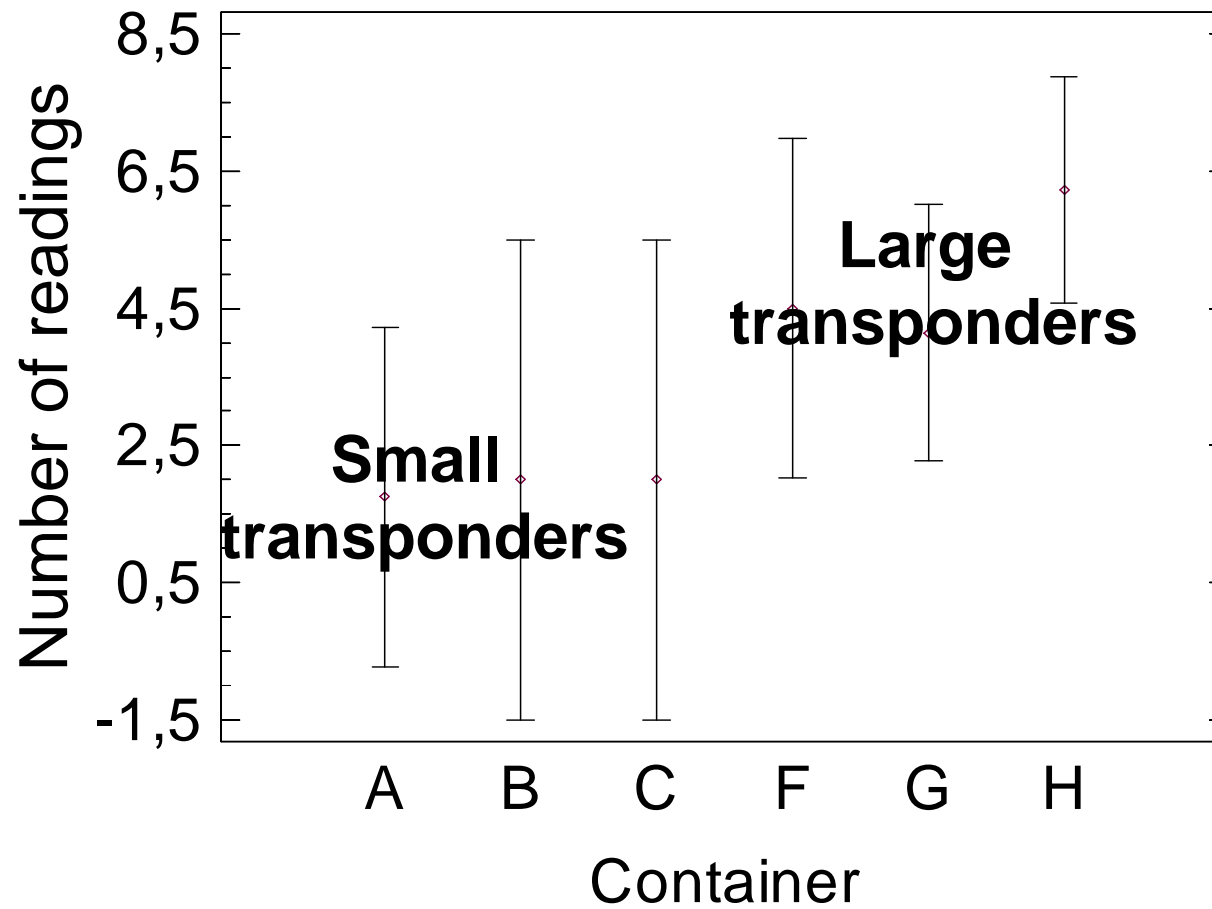


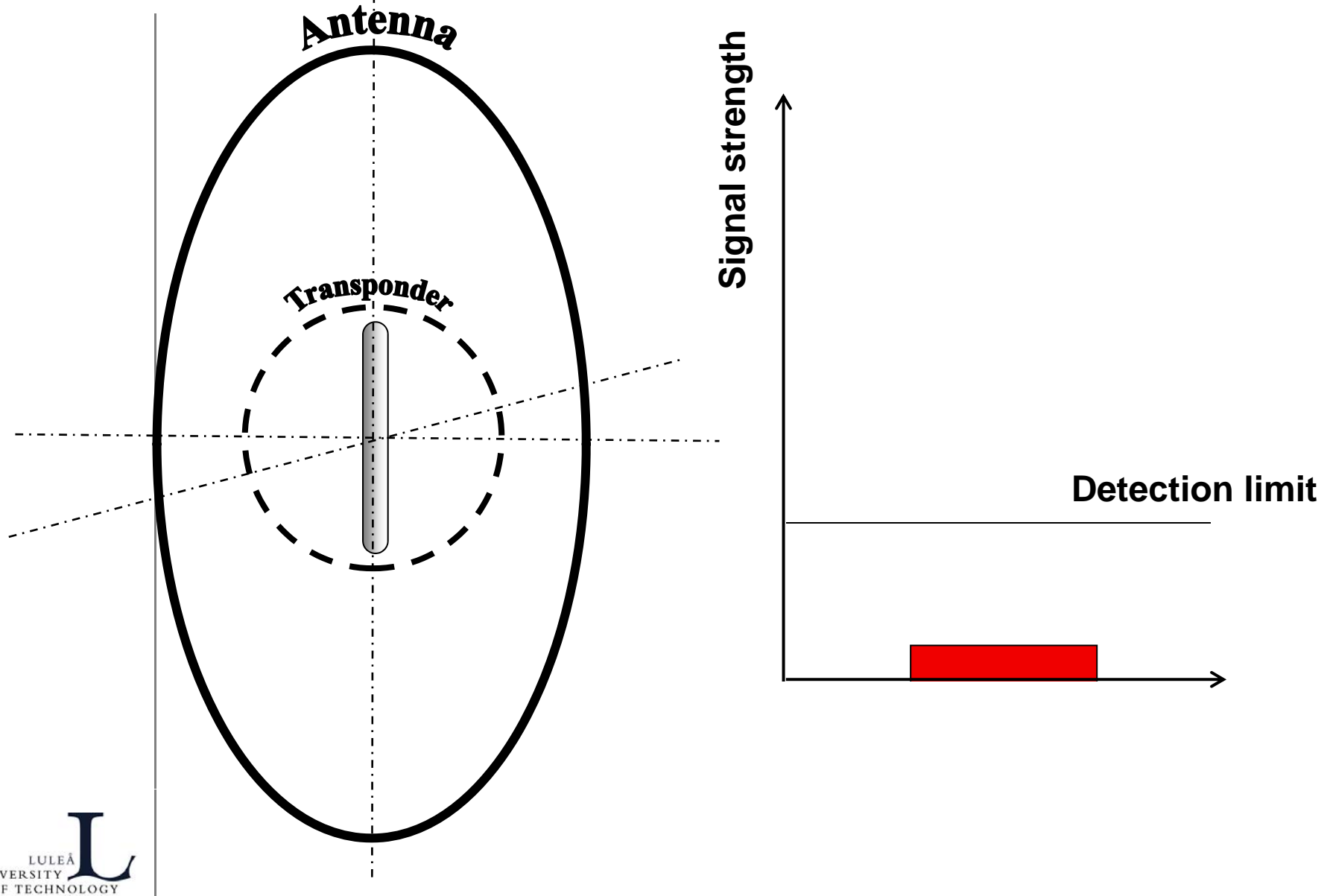


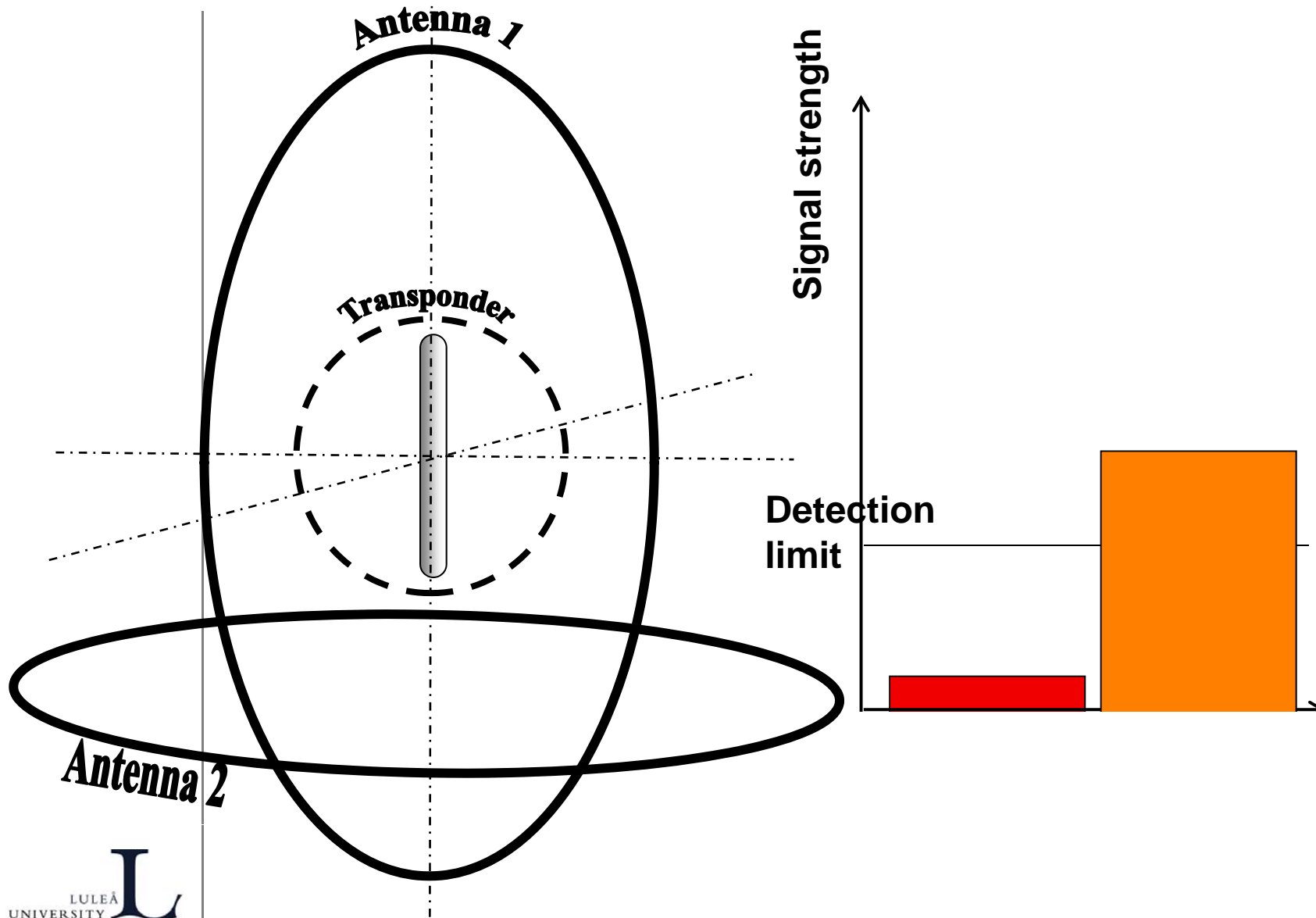


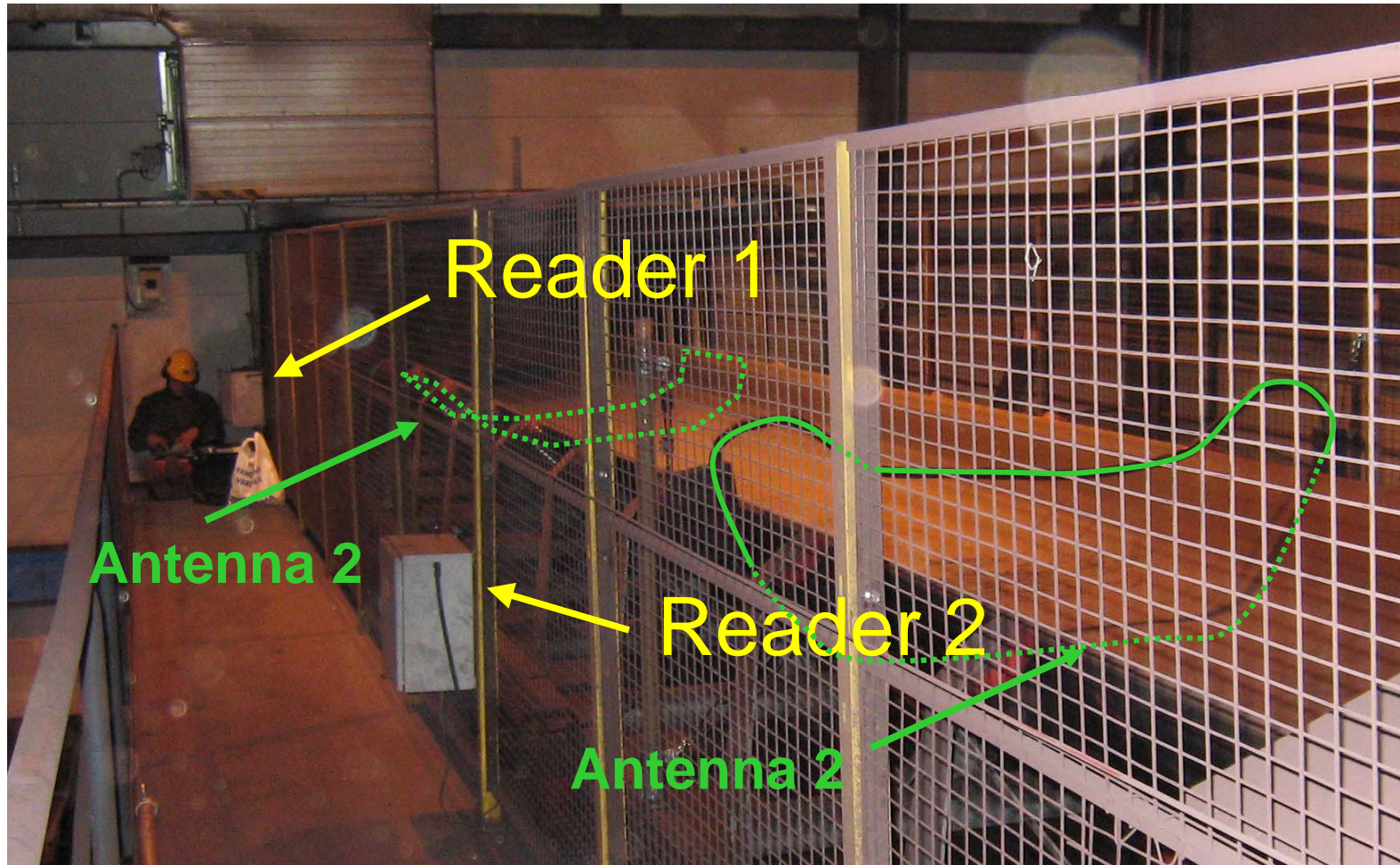




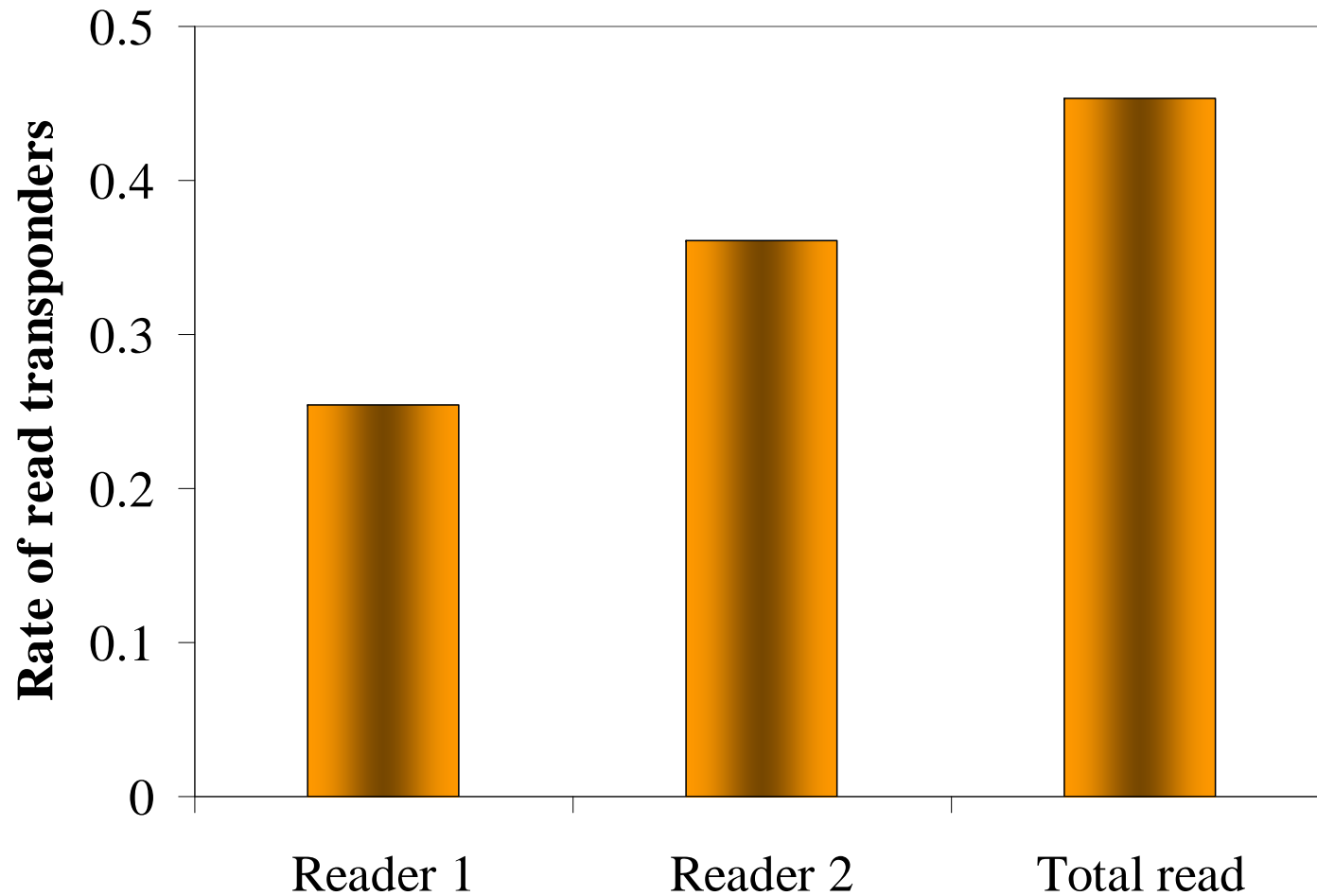


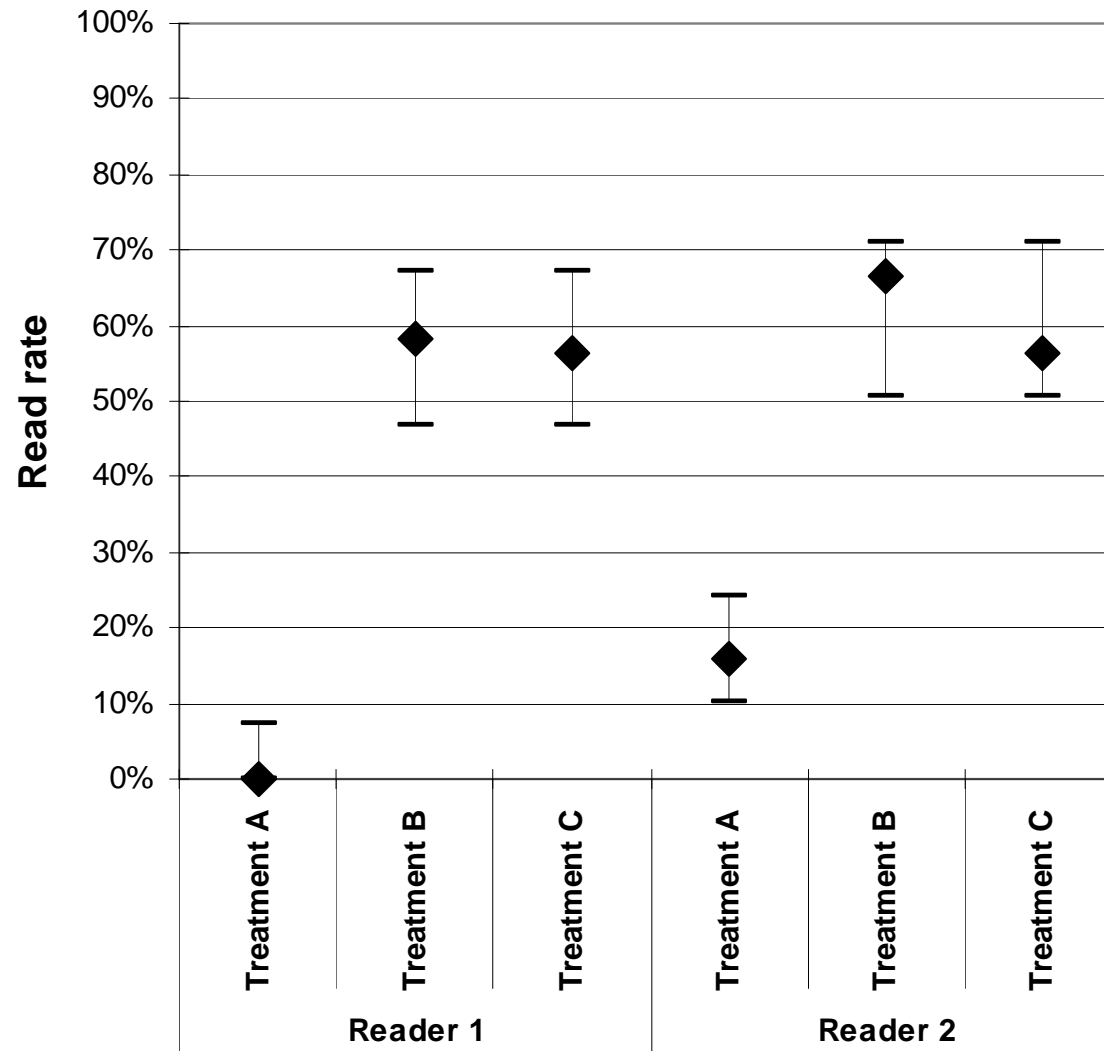




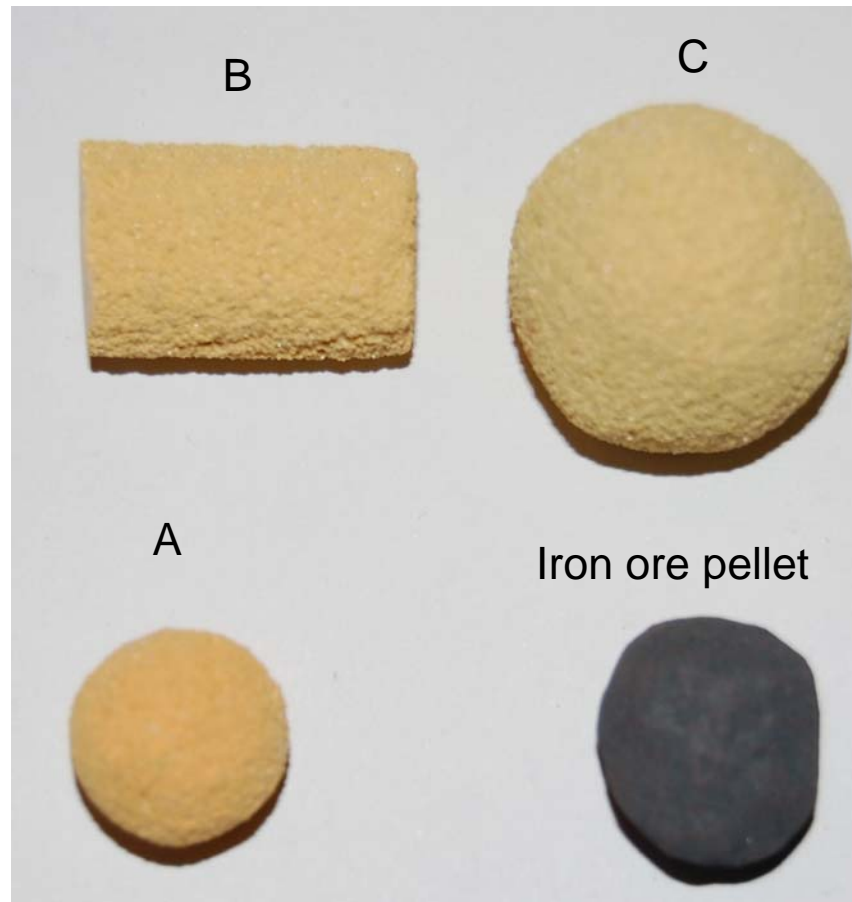


### Read rate, all types of transponders



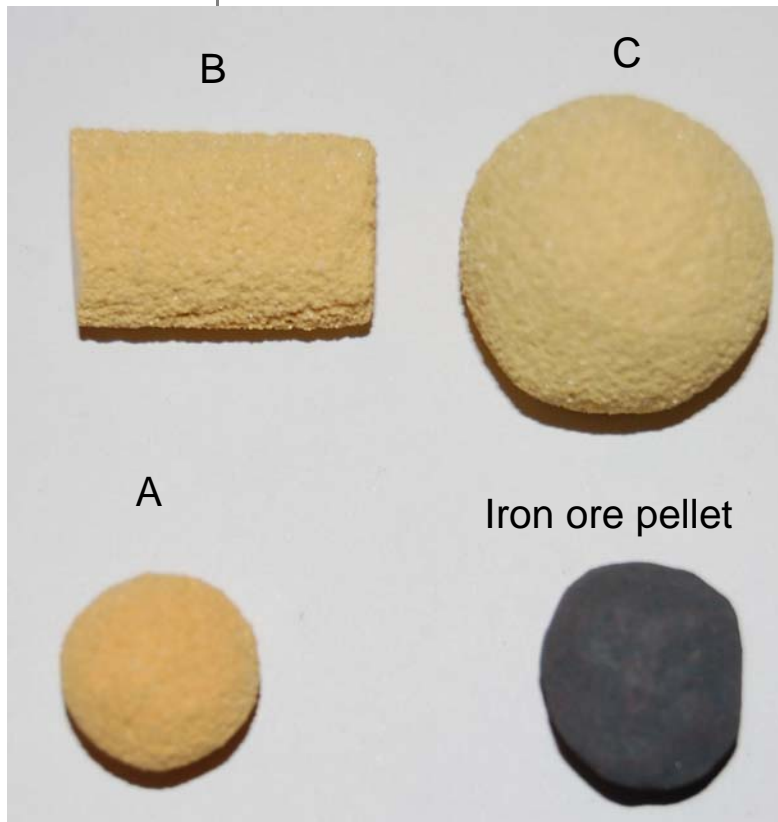


# Brazil nut effect

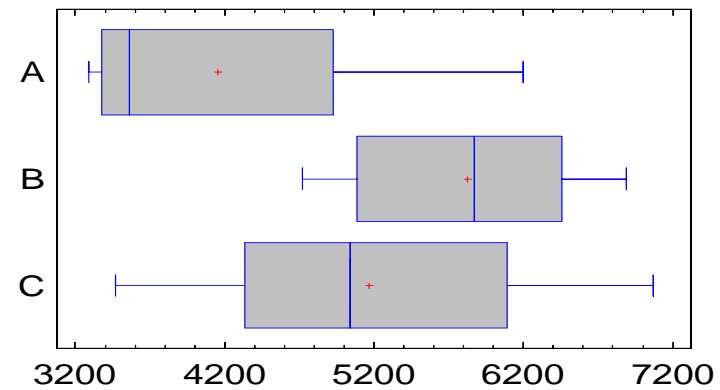


$$\frac{d_l}{d_s} \approx \left( \frac{\rho_s}{\rho_l} \right)$$

# Residence times of two experiments

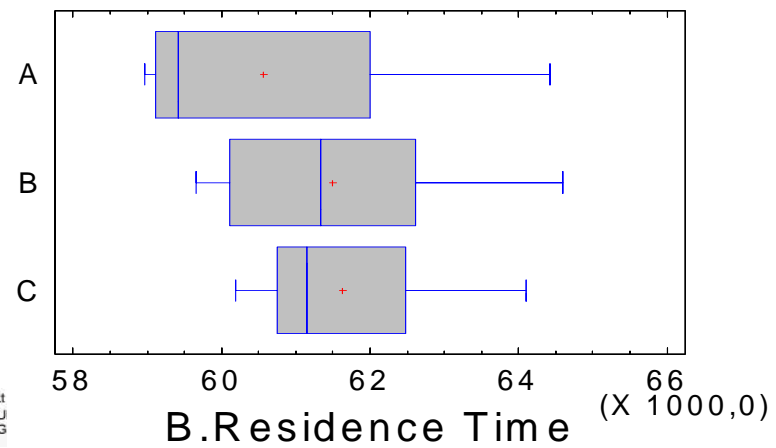


Box-and-Whisker Plot



A. Residence time

Box-and-Whisker Plot



B. Residence Time (X 1000,0)

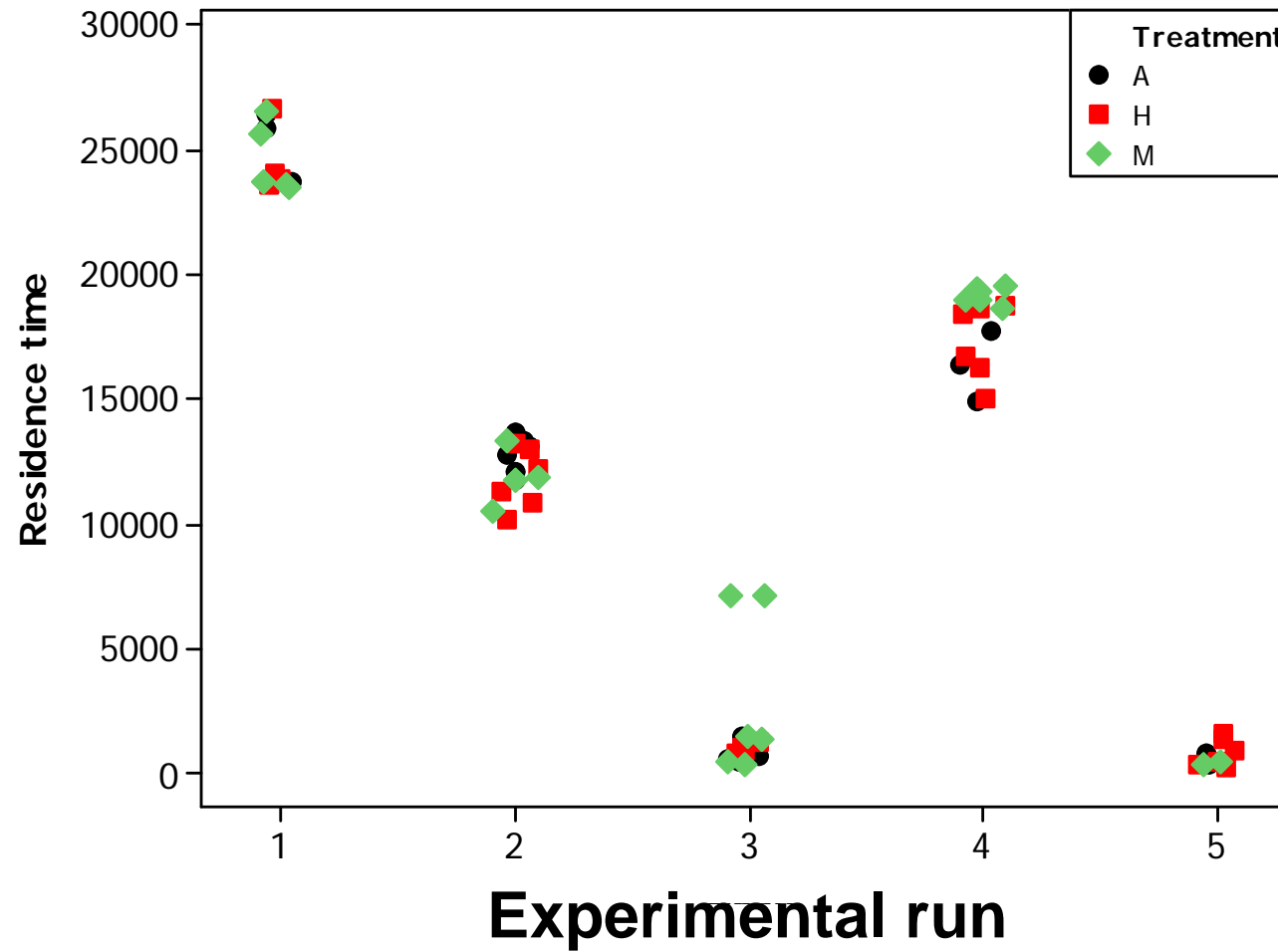
## Follow up experiments



A-type: spheres with 12mm tags, 4.3 g/cm<sup>3</sup> density

M-type: spheres 4.3 g/cm<sup>3</sup> density (same as pellets)

H-type: spheres 6.1 g/cm<sup>3</sup> density



# Ongoing work

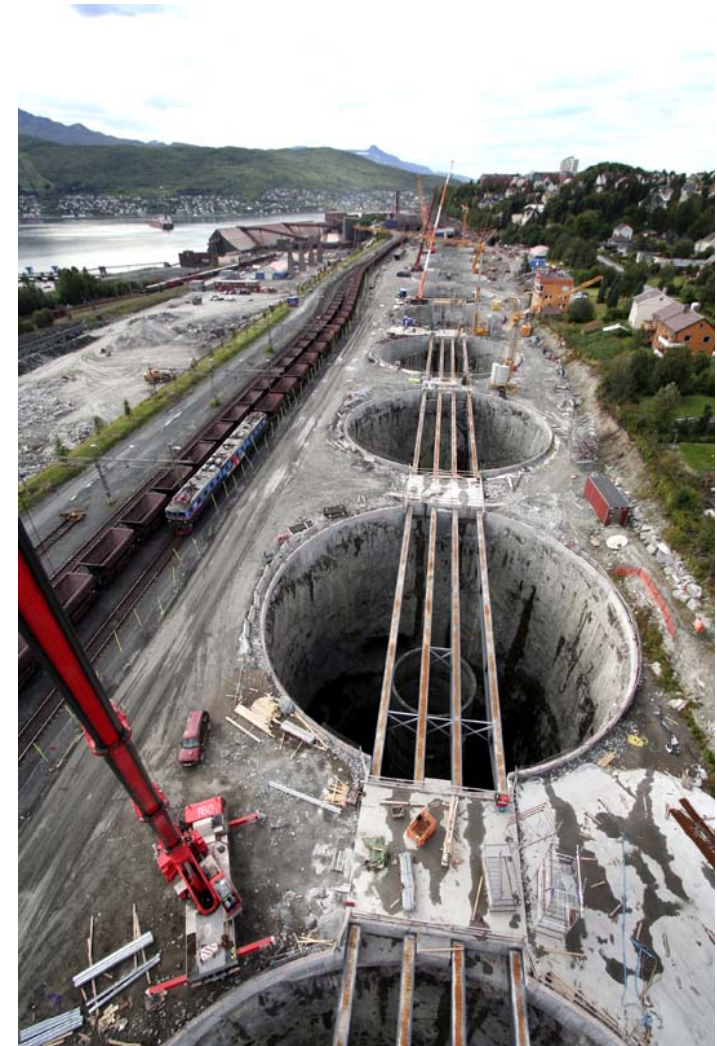
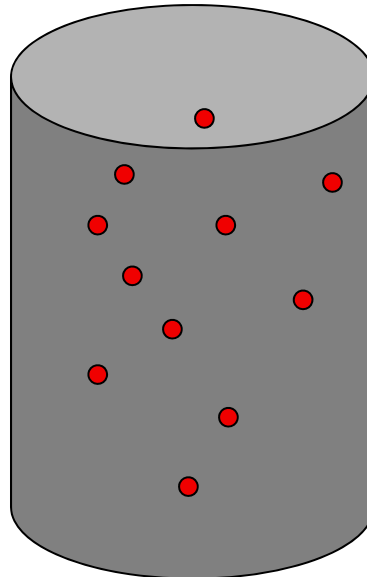
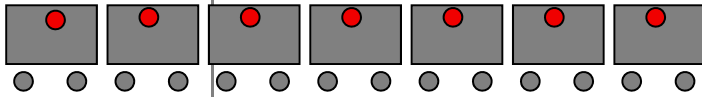


# BACK TO THE FUTURE III

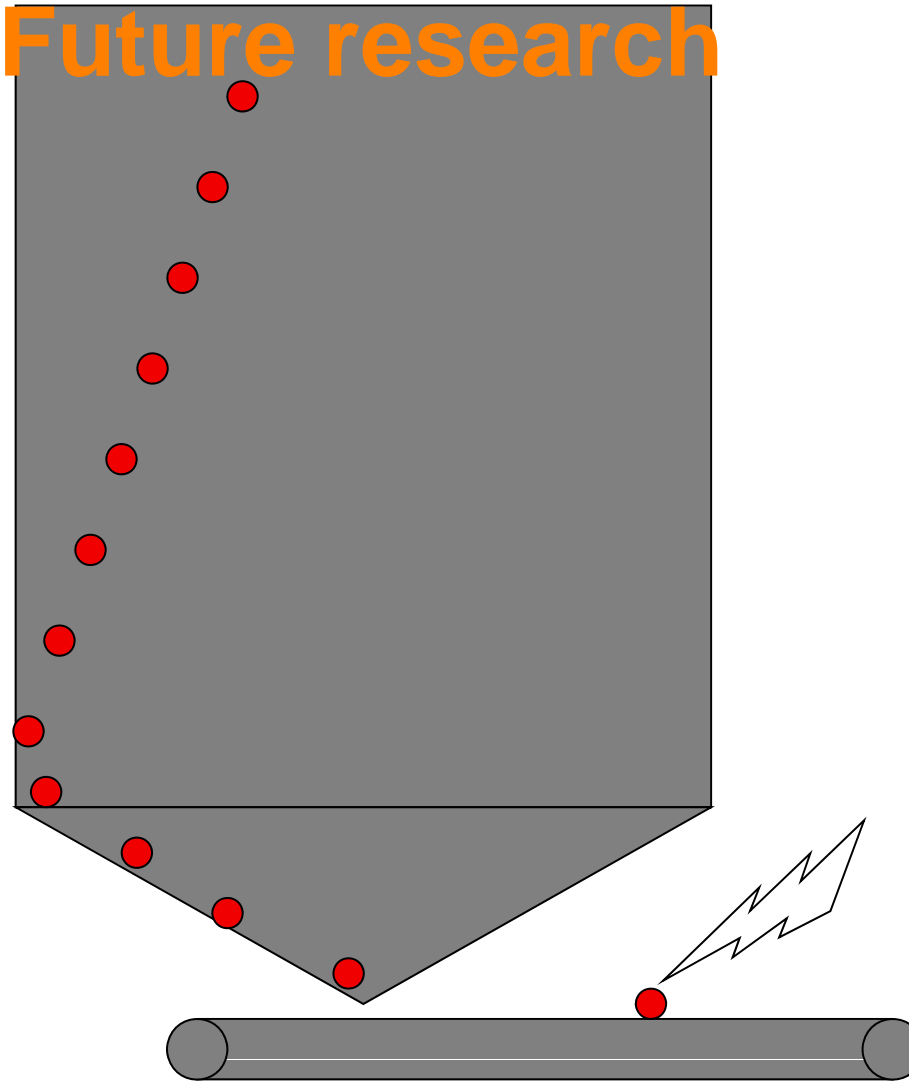


EXPANDED  
MOTION  
PICTURE  
SCORE

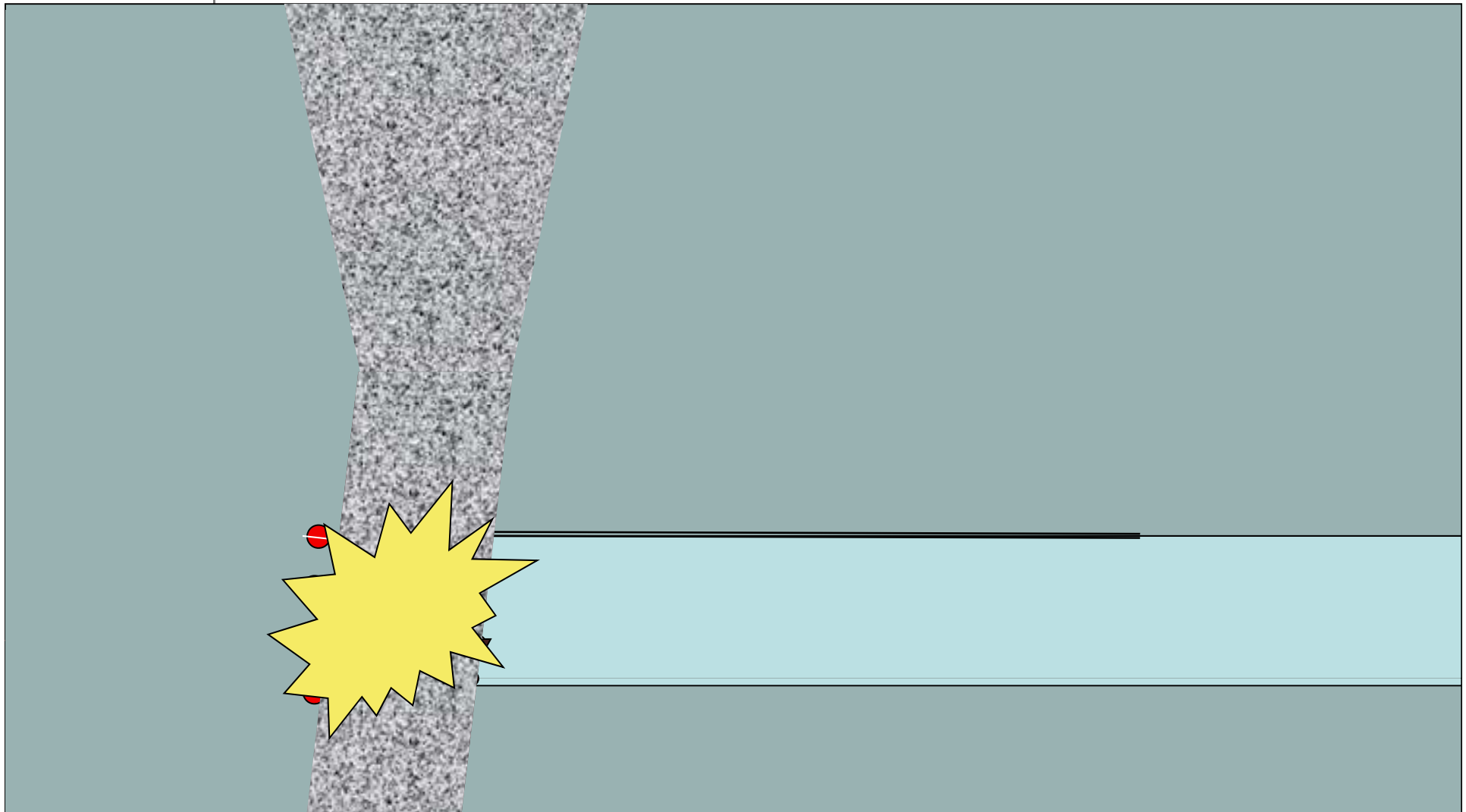
# Future research



# Future research



# Future research



# Blast furnace

