FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Institute for Multiscale Simulation

MSS

PhD defense

Manuel Baur

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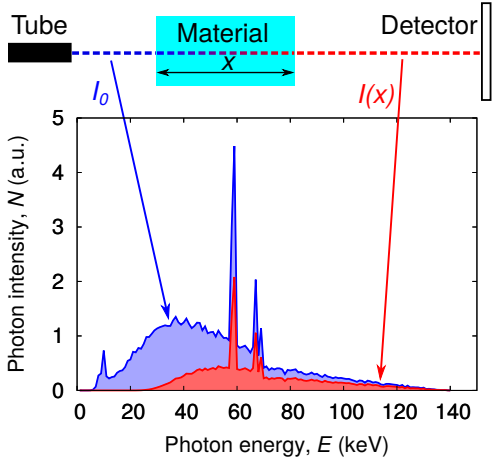
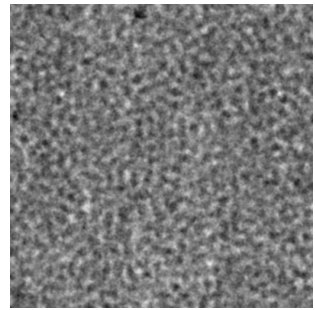
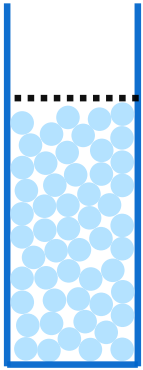
X-ray radiography of granular systems – particle densities and dynamics



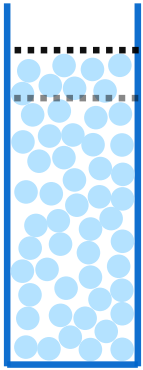


X-ray radiography of granular systems – particle densities and dynamics



Φ = RLP

X-ray radiography of granular systems – particle densities and dynamics

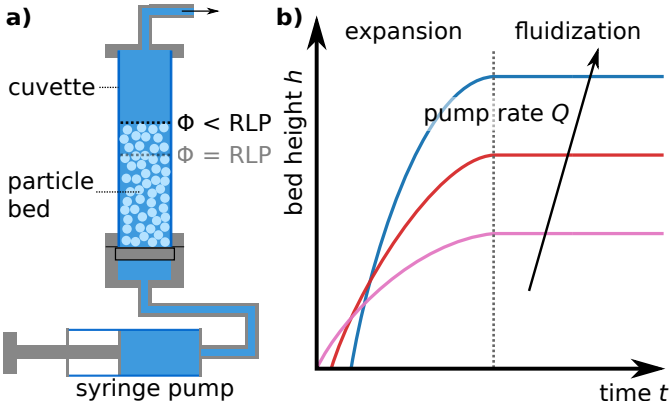


$\Phi < RLP$

$\Phi = RLP$

X-ray radiography of granular systems – particle densities and dynamics

Fluidized bed

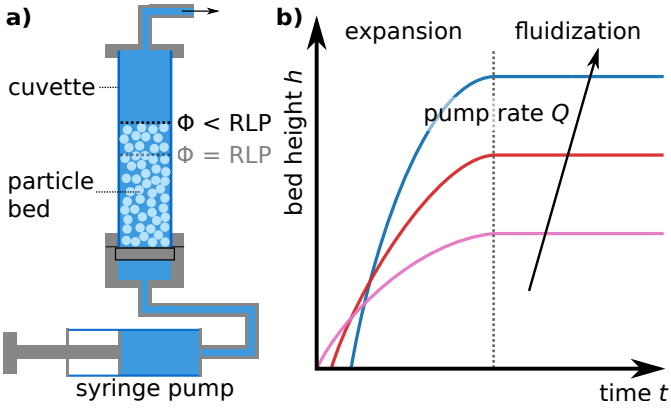


X-ray radiography of granular systems – particle densities and dynamics

Densities

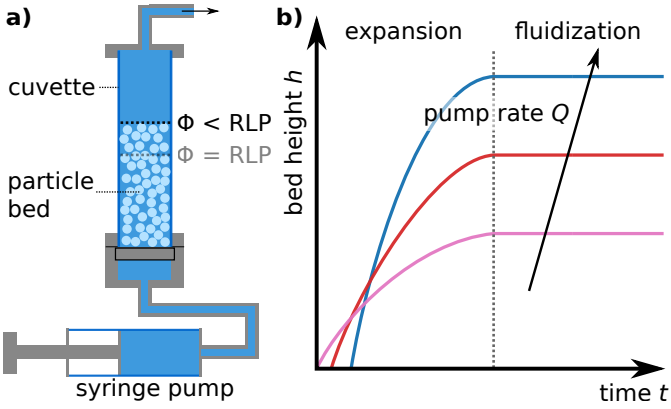
Dynamics

Fluidized bed



X-ray radiography of granular systems – particle densities and dynamics

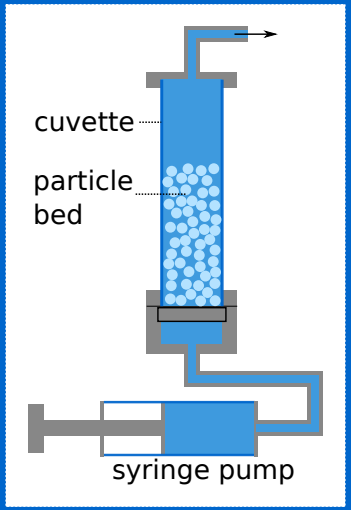
Fluidized bed

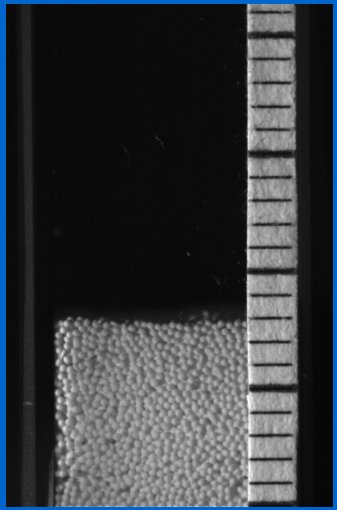


Fluidized bed reactor

"**Lack of understanding:**
It is very difficult to predict and calculate the complex mass [...] flows within the bed."

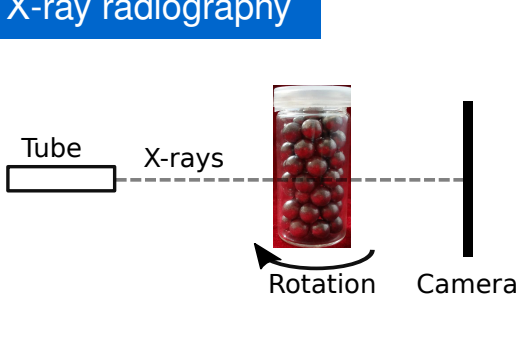
Particulate flows are **opaque**

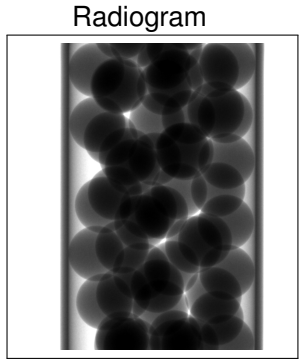




Master thesis Welm Pätzold

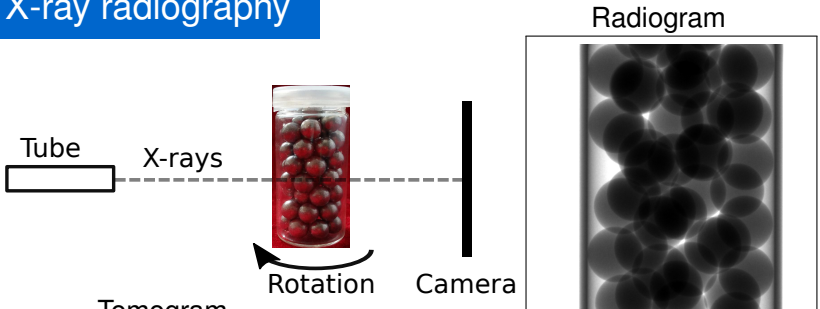
X-ray radiography





2D projections of 3D object
Short acquisition time

X-ray radiography

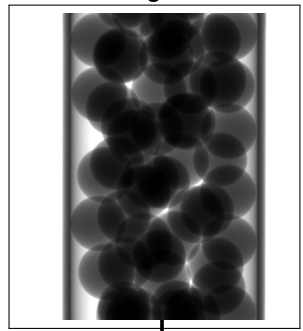


2D projections of 3D object
Short acquisition time

Full 3D information
Long acquisition time
$\rightarrow$ static objects

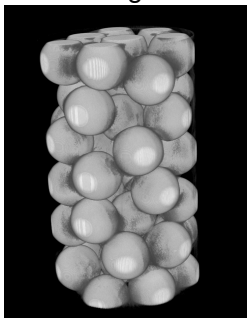
X-ray radiography

Radiogram



2D projections of 3D object
Short acquisition time

Tomogram



Reconstruction from
800 projections

Full 3D information
Long acquisition time
$\rightarrow$ static objects

Dynamic system