



Tomography for large industrial equipment

EOSC (European Open Science Cloud) – EOSC DIH

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Muon Tomography: a new NDT

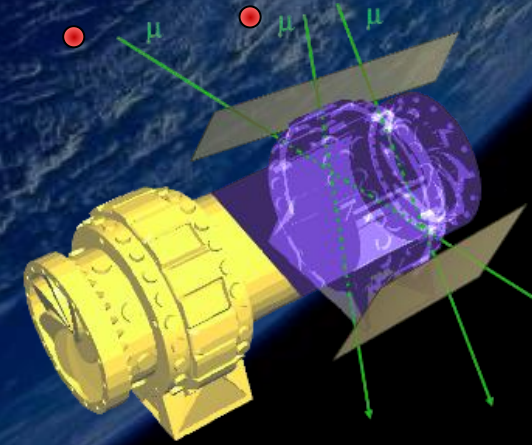
Reconstruction of the inner geometry of large structures up to millimetric precision



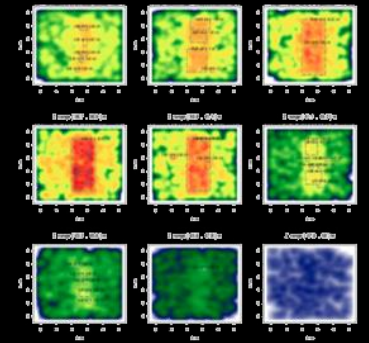
Natural Radiation



Constant Flux



Detection



Reconstruction

Feasibility studies
Muon tomography service
Permanent facilities

Muon Systems

Muon Systems is a Spanish private Company founded in 2015 and based in Bilbao (Spain).

Focused on cosmic muon tomography systems for application in the heavy industry.

The Company is founded by 2 members using exclusively **private capital**.

Co-founder



Carlos Díez

CEO

Physicist
Researcher at CMS - CERN
R&D Project manager

Co-founder



Dr. Pablo Martínez

Technology consultant

PhD. Physicist
Researcher at CMS - CERN
Senior Scientist ETH Zurich
RyC Researcher at IFCA



Dr. Pablo Gómez

CTO

PhD. Physicist
Researcher Guided Waves
Project manager Arcelor-Mittal

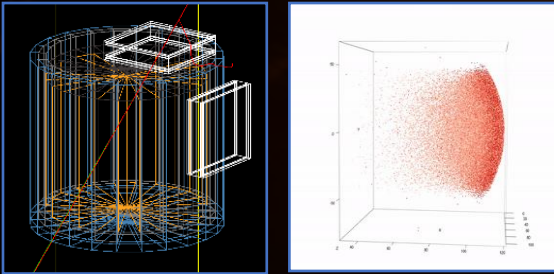
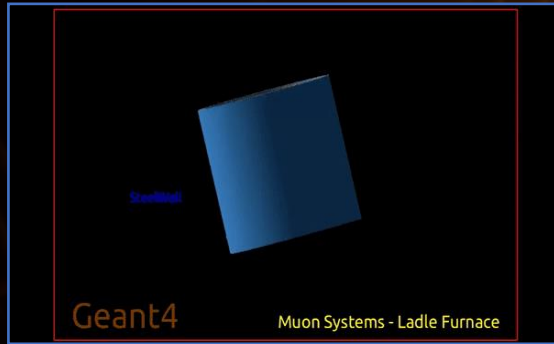


Aitor Orio

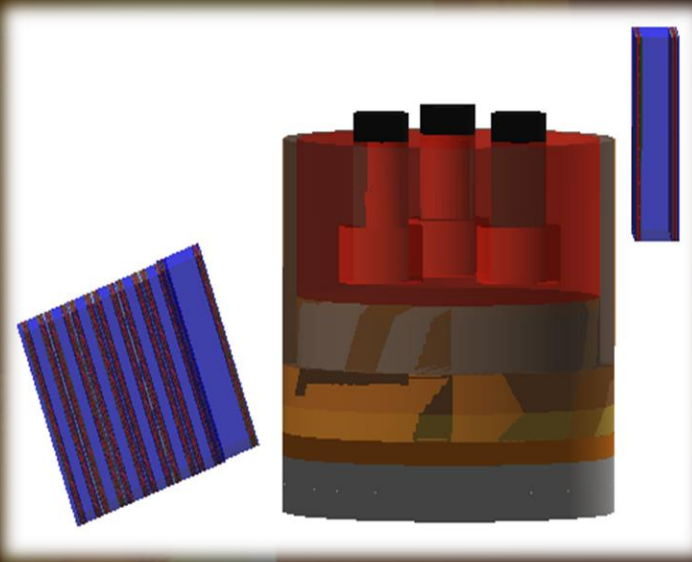
Engineering manager

Industrial Electronics Engineer
Master Automation and Robotics
Manufacturing Project Engineer

The pilot: a fully-functional muography simulation of a blast furnace

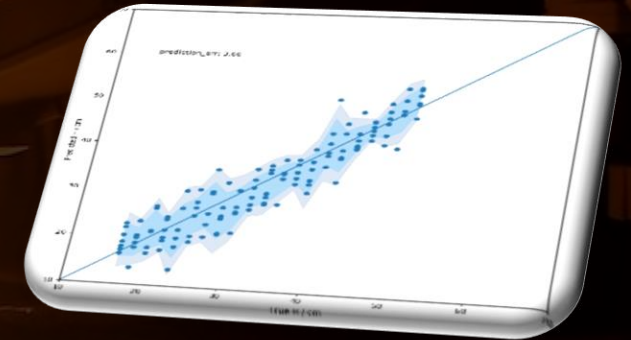


Previous
simulations



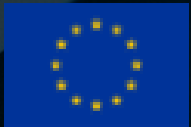
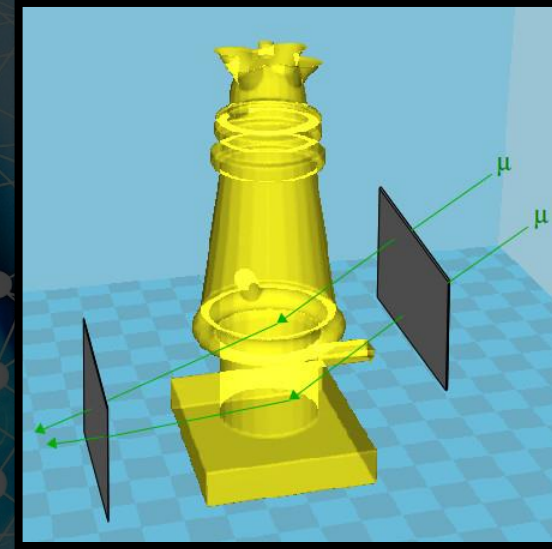
Advanced
simulations

Thickness of the
refractory wall



Algorithms and
data analysis

- Extensive use of computational resources to run highly realistic simulations: geometric modelling, materials and detectors.
- Application of sophisticated muography reconstruction algorithms
- Interest about funding opportunities raised and shared by the organization



EOSC-hub receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 777536.

Impact of the pilot

- **Development of realistic and industrial solutions** to measure blast furnace's refractory wall thickness in operation
- **Proposal of a feasibility study** about the preventive maintenance of refractory walls using muon tomography to companies Muon Systems work with
- **Expansion of the technique to other applications in the new market** opened thanks to this project, namely, general preventive maintenance and performance optimization in blast furnaces.
- **Help to participate in a research project** related to silicon manufacturing optimization and search for possibilities to launch more.



Muon tomography represents the future of the non-invasive techniques for the inspection of large structures and industrial equipment in operation.

Thank you

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