LADICIM:
EIDEIC-2017

SLAB TRACK MANUFACTURING FROM RECYCLED OUT OF SERVICE BALLASTED TRACK. ANALYSIS OF FATIGUE BEHAVIOUR USING COMPUTARIZED TOMOGRAPHY (CT)

Jose Adolfo Sainz-Aja Guerra

UC UNIVERSIDAD DE CANTABRIA

Escuela de Doctorado

PROGRAMA DE DOCTORADO EN INGENIERÍA CIVIL (PDIC)

CANTABRIA CAMPUS INTERNACIONAL

LADICIM
LABORATORIO DE LA DIVISIÓN DE CIENCIA E INGENIERÍA DE LOS MATERIALES

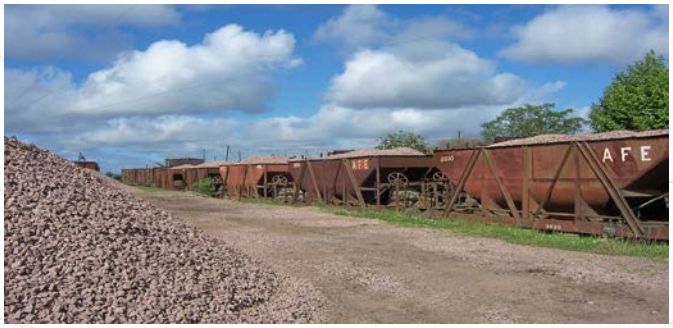
UC UNIVERSIDAD DE CANTABRIA

Why should we replace railway superstructure?

- LADICIM
- **Introduction**
- Mechanical tests
  - Compression
  - Fatigue
- Computerized Tomography (CT)
- Comparative
- Conclusions

What is done with these wastes?

- LADICIM
- **Introduction**
- Mechanical tests
  - Compression
  - Fatigue
- Computerized Tomography (CT)
- Comparative
- Conclusions

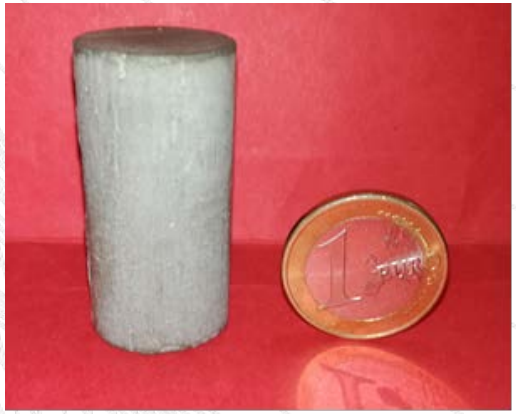


RAILCYCLED PROYECT

- LADICIM
- **Introduction**
- Mechanical tests
  - Compression
  - Fatigue
- Computerized Tomography (CT)
- Comparative
- Conclusions

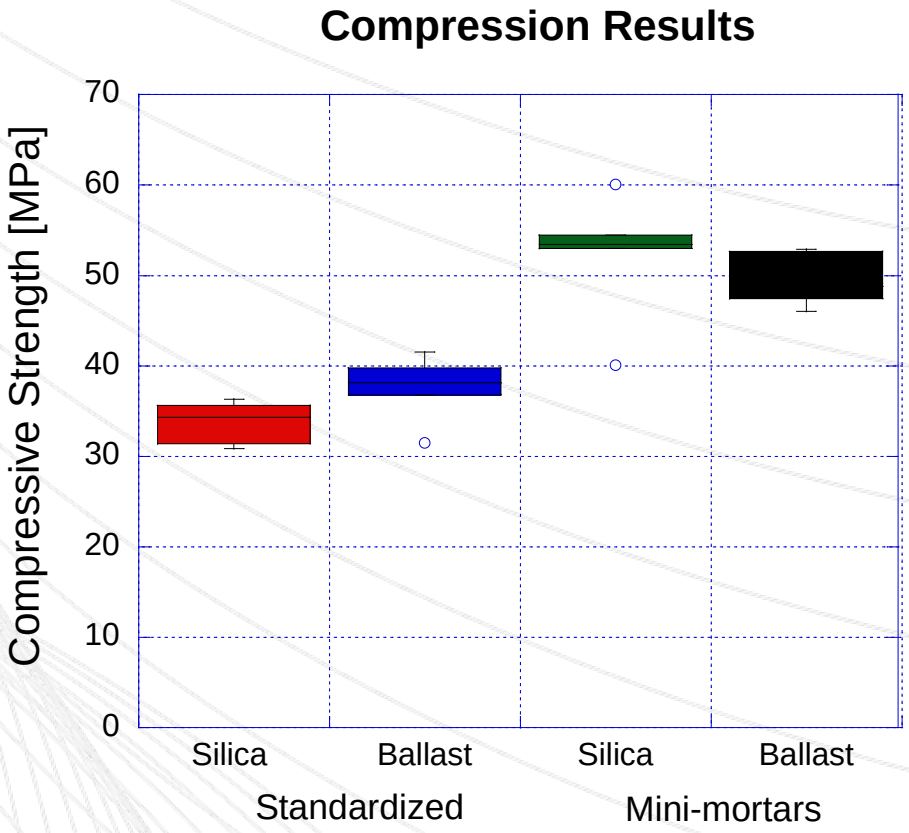
Samples:

- Standardized mortars (40x40x160 mm)
- Mini-Mortar-Samples (h=40;ø=20 mm)



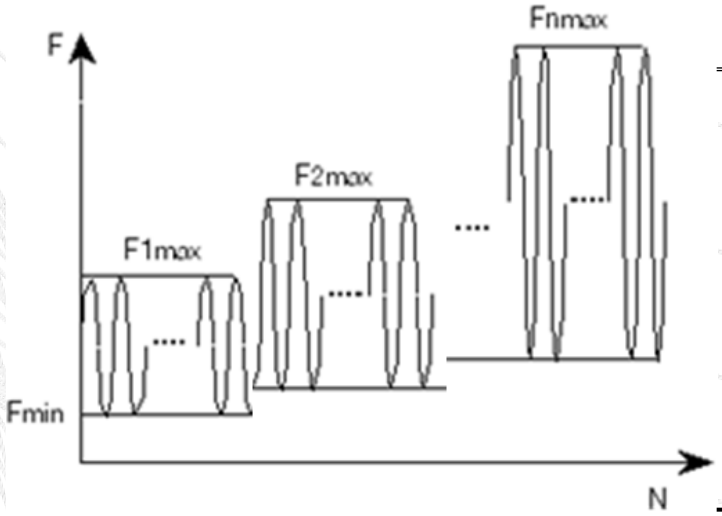
- LADICIM
- Introduction
- Mechanical tests
  - **Compression**
  - Fatigue
- Computerized Tomography (CT)
- Comparative
- Conclusions

Compression results



- LADICIM
- Introduction
- Mechanical tests
  - Compression
  - **Fatigue**
- Computerized Tomography (CT)
- Comparative
- Conclusions

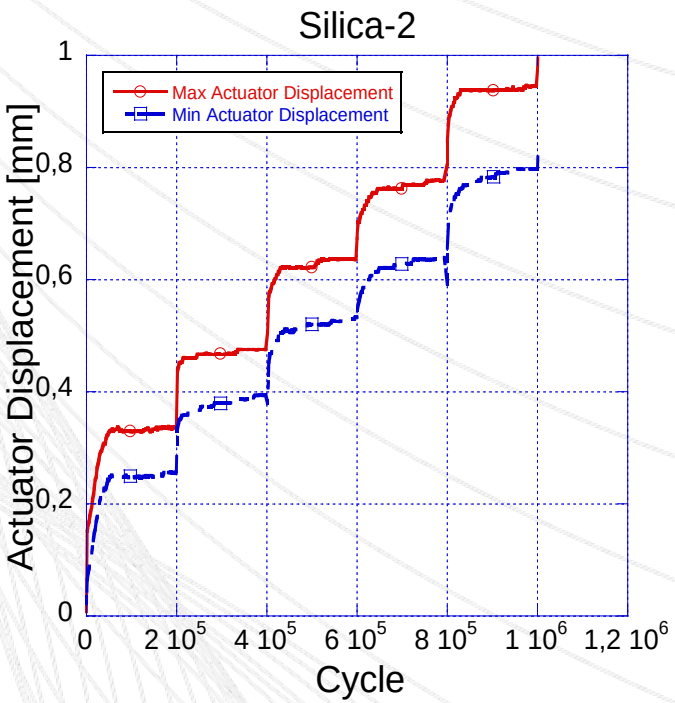
Locati method

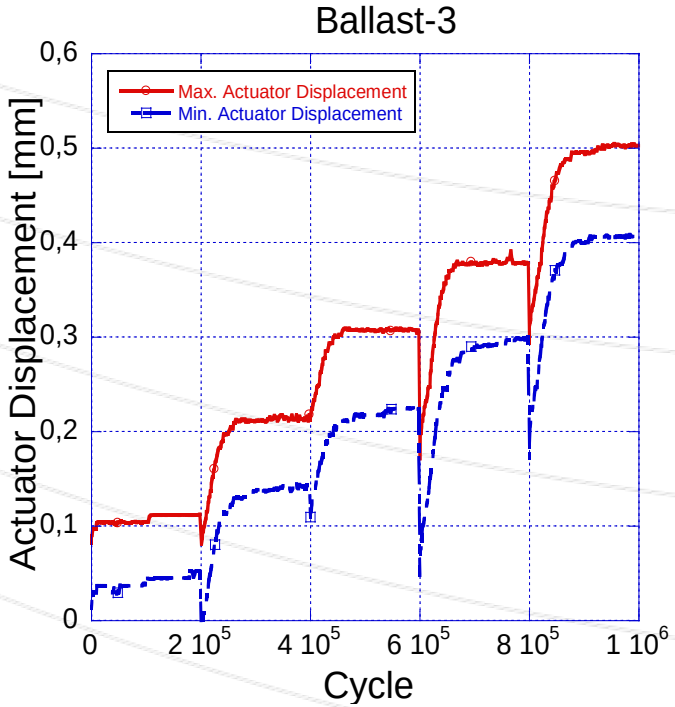


Step	Max compressive Load [kN]	Min Compressive Load [kN]	Medium Load [kN]	Amplitude [kN]
1	2.62	0.226	1.44	1.18
2	4.36	0.44	2.40	1.96
3	6.10	0.62	3.36	2.74
4	7.84	0.80	4.32	3.52
5	9.58	0.98	5.28	4.30
6	11.32	1.16	6.24	5.08
7	13.06	1.34	7.20	5.86
8	14.8	1.52	8.16	6.64
9	16.54	1.70	9.12	7.42
10	18.28	1.88	10.08	8.20

- LADICIM
- Introduction
- Mechanical tests
  - Compression
  - **Fatigue**
- Computerized Tomography (CT)
- Comparative
- Conclusions

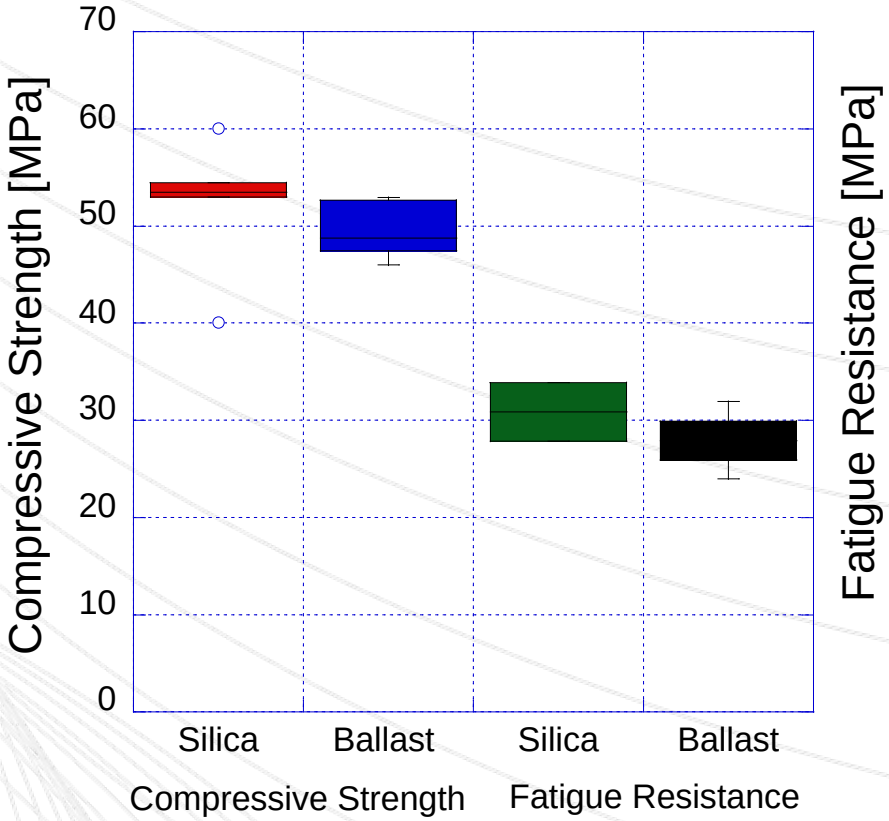
Locati results





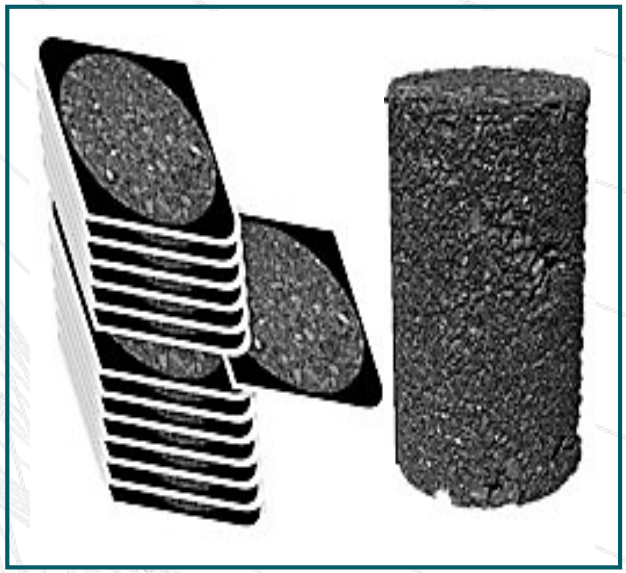
- LADICIM
- Introduction
- **Mechanical tests**
  - Compression
  - Fatigue
- Computerized Tomography (CT)
- Comparative
- Conclusions

Fatigue results

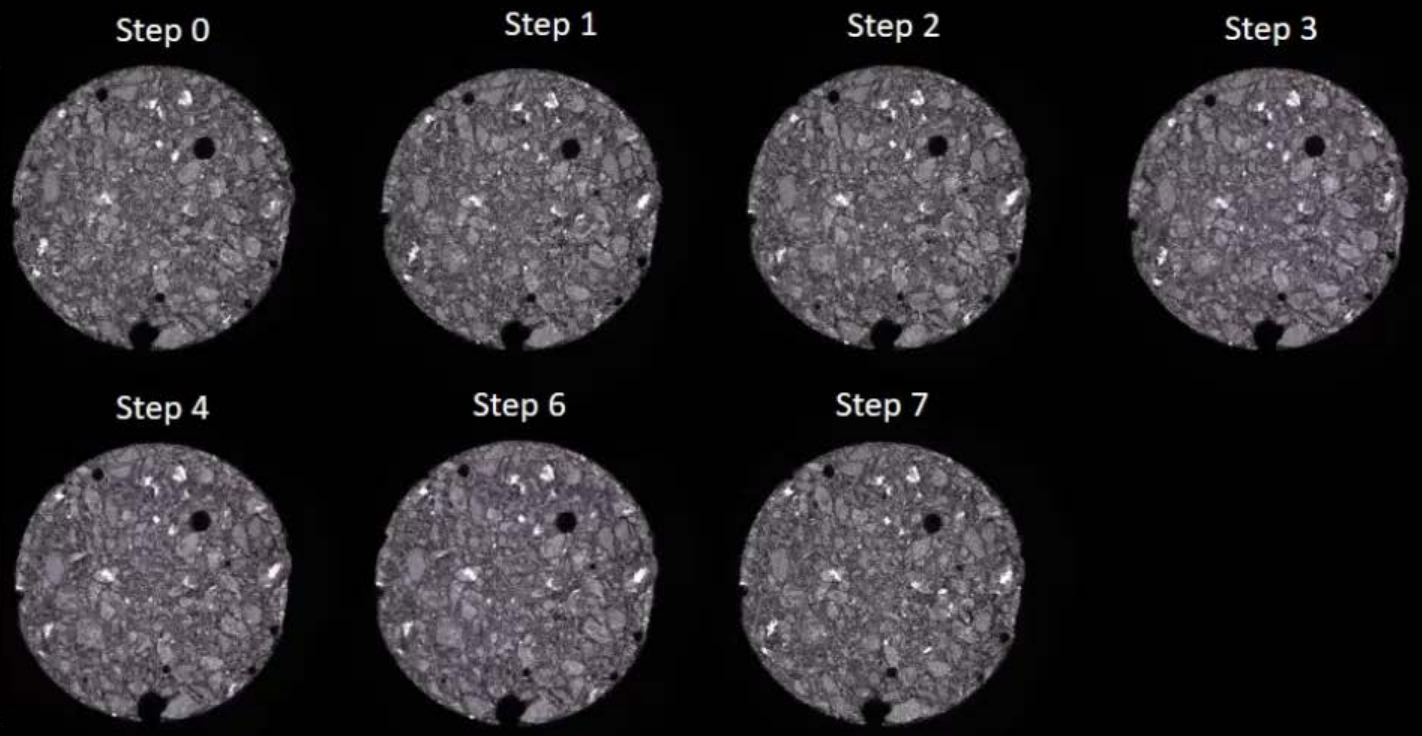


Computerized Tomography (CT)

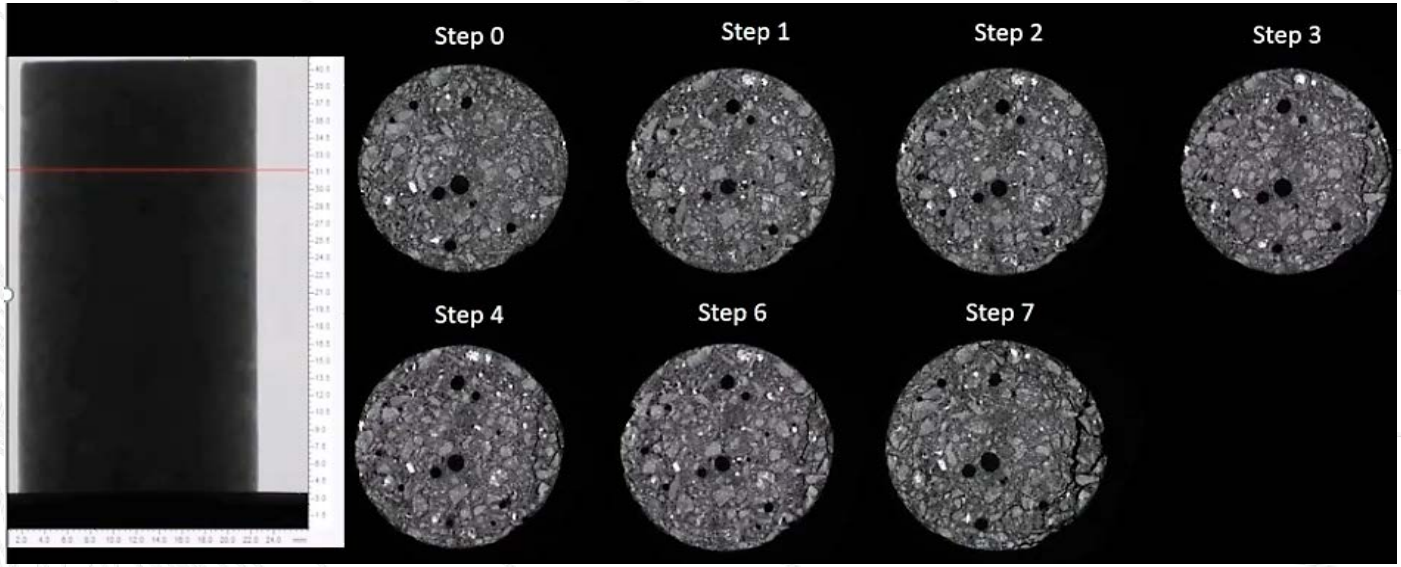
- LADICIM
- Introduction
- Mechanical tests
  - Compression
  - Fatigue
- **Computerized Tomography (CT)**
- Comparative
- Conclusions



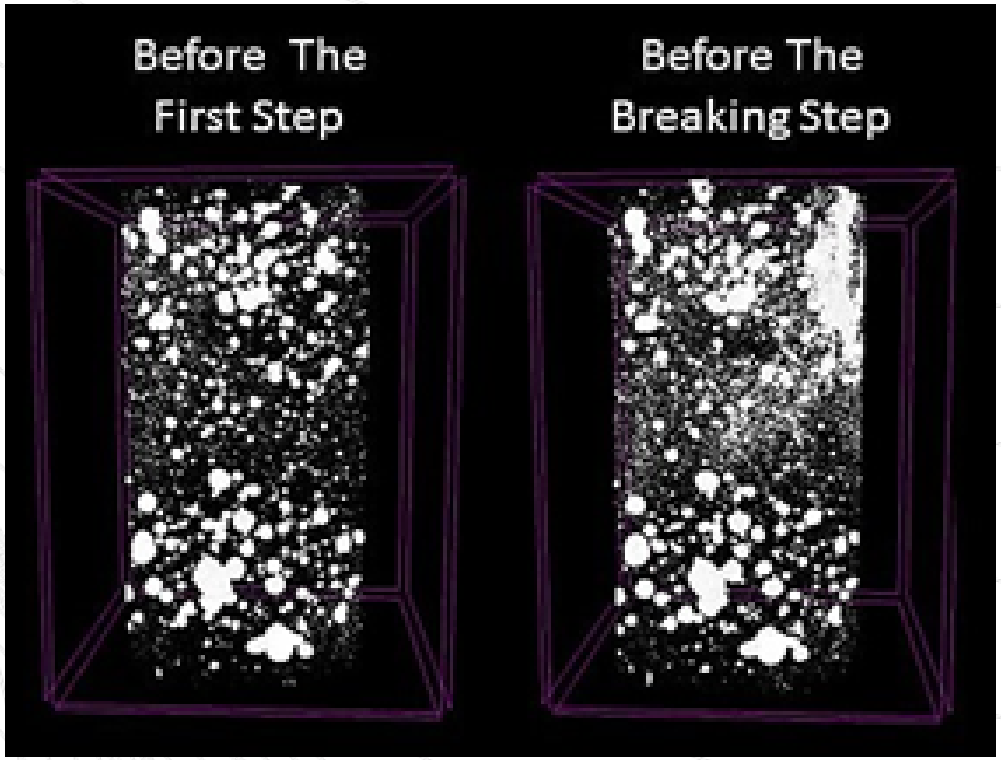
SLAB TRACK MANUFACTURING FROM RECYCLED OUT OF SERVICE BALLASTED TRACK. ANALYSIS OF FATIGUE BEHAVIOUR USING COMPUTARIZED TOMOGRAPHY (CT)



Computerized Tomography (CT) results

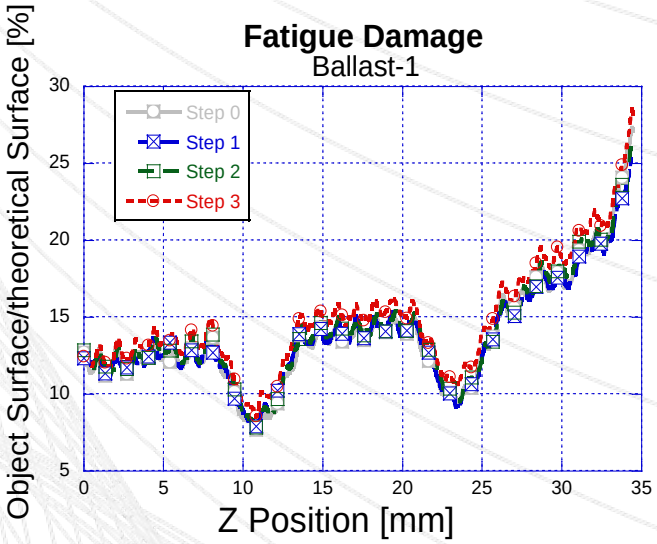


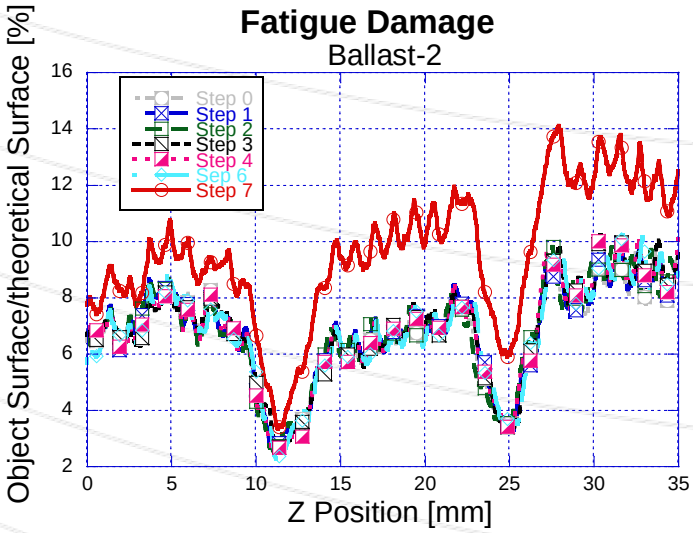
Computerized Tomography (CT) results



Computerized Tomography (CT) results

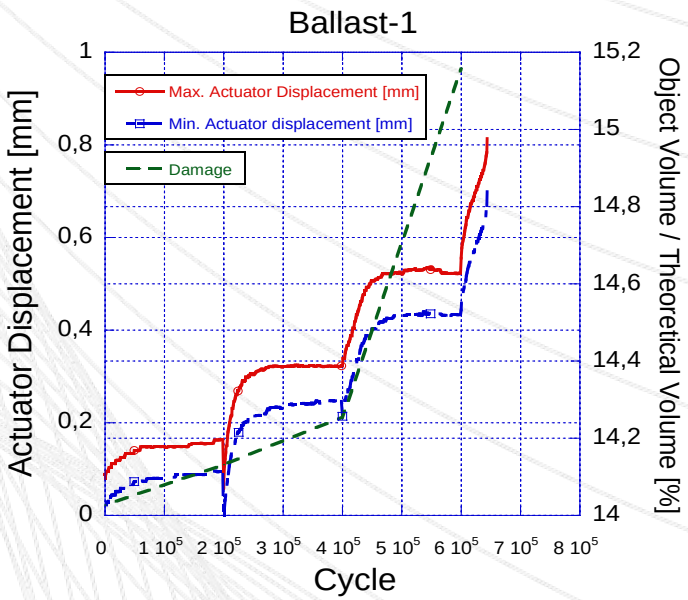
- LADICIM
- Introduction
- Mechanical tests
  - Compression
  - Fatigue
- **Computerized Tomography (CT)**
- Comparative
- Conclusions

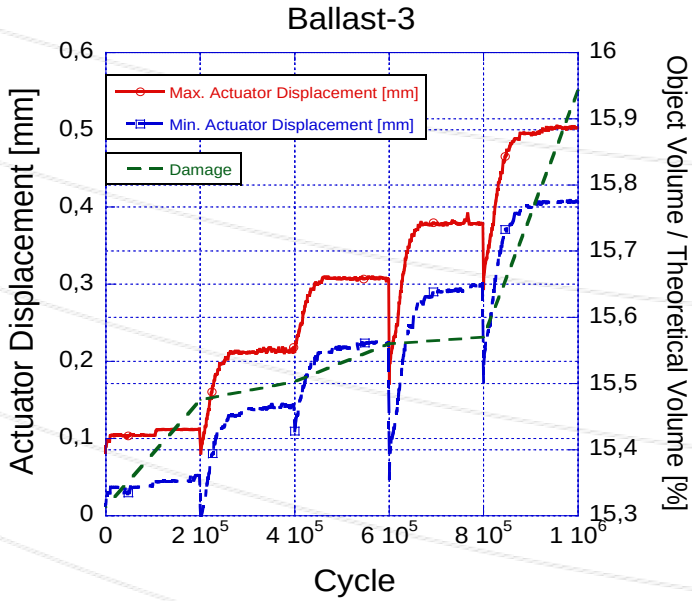




Locati VS “CT”

- LADICIM
- Introduction
- Mechanical tests
  - Compression
  - Fatigue
- Computerized Tomography (CT)
- **Comparative**
- Conclusions





This study concludes that Computed Axial Tomography is extremely useful both for the analysis of the damage suffered by a sample due to fatigue, as well as to explain fluctuations in the results due to the presence of internal defects of the samples.

Thank you very much for your attention