

DE LA RECHERCHE À L'INDUSTRIE

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MULTI-TASKS BENCH PLACIDE I

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SUMMARY

I Introduction

II Multi-tasks bench

III Cutting module/Eddy current location

IV Measurement module : Edge Finder

V Conclusion

I Introduction

- This presentation introduces the technical capabilities of the multi-tasks (cutting operations and none destructive examinations) PLACIDE I bench:
- Designed in early 2000, this multi-tasks bench named Placide still operates cutting tasks successfully today ,
- But... since a few years, we notice :
- The profilometry and spectrometry modules are out of service,
- Aging of secondary components on overall equipment,
- Obsolescence of controllers makes maintenance difficult and expensive,
- So, with our feedback, our laboratory decided to study and complete a new apparatus.

II Multi-tasks bench

SUMMARY

I Introduction

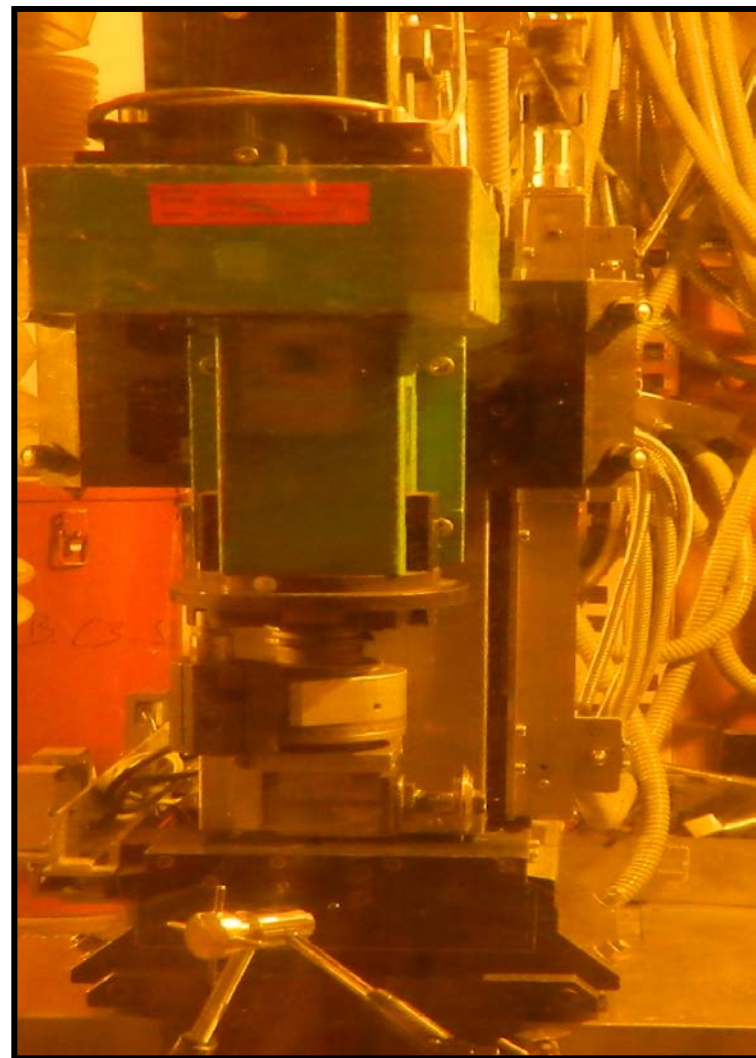
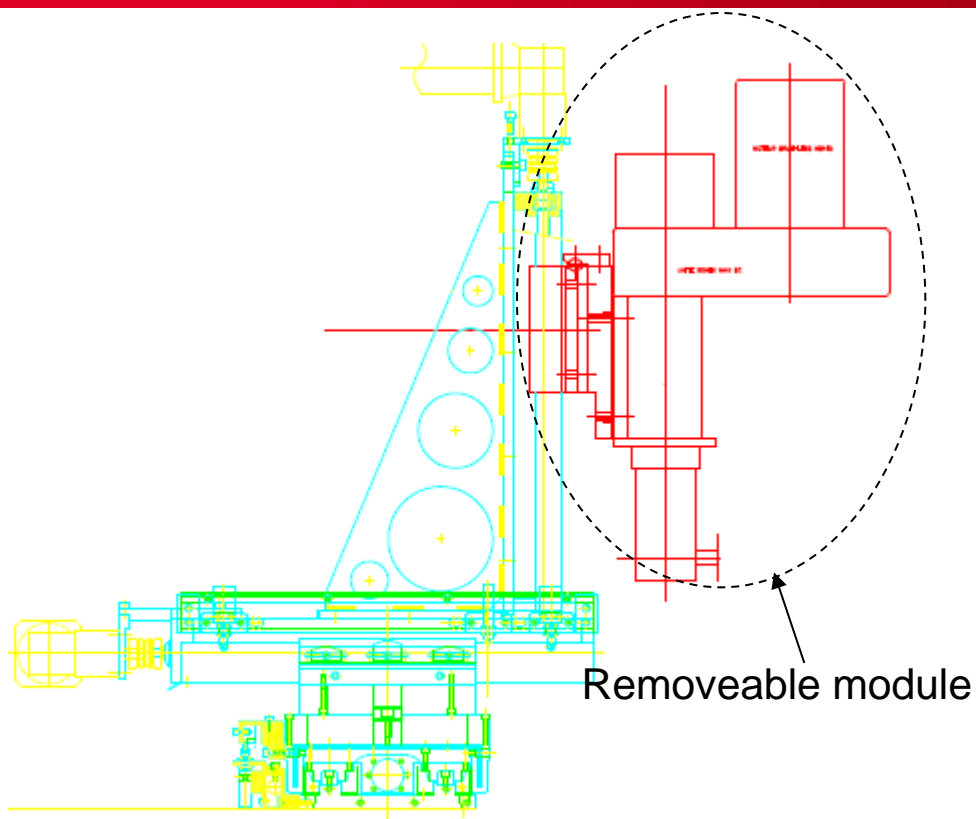
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II Multi-tasks bench



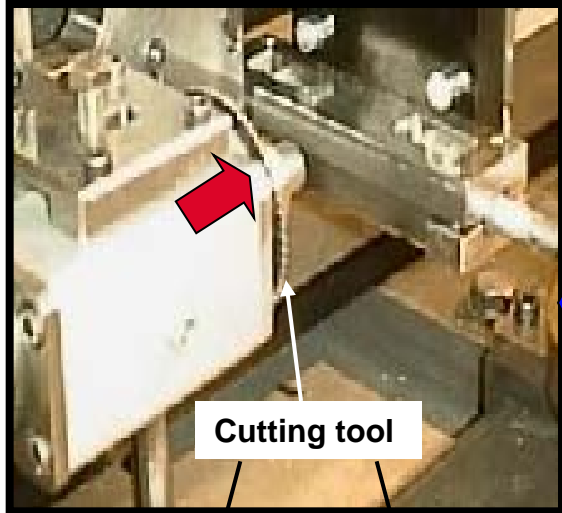
Overall view of the bench

Technical specifications :

- Industrial 3 axis bench adapted to be used in hot cell,
- Modularity,
- Components resist to irradiation,
- motor rotation speed up to 5000 tr/mn,
- Longer stroke up to 1500 mm,
- Flexibility to chuck any geometry of pieces (structure, plate, rods...),
- The driving can be realized by a numerical control.

II Multi-tasks bench

I Cutting module/Eddy current technique



Coated drill saw from 0.2 mm width



2 Tool holder



3 Edge finder

4 The Profilometry and spectrometry modules are out of service

SUMMARY

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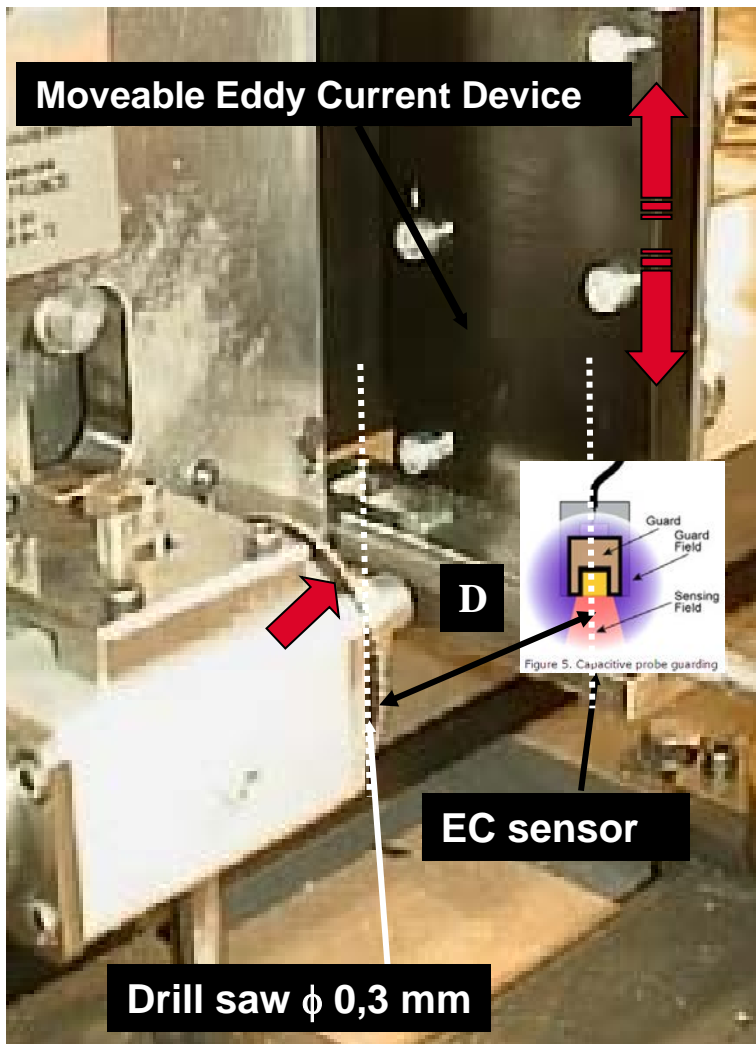
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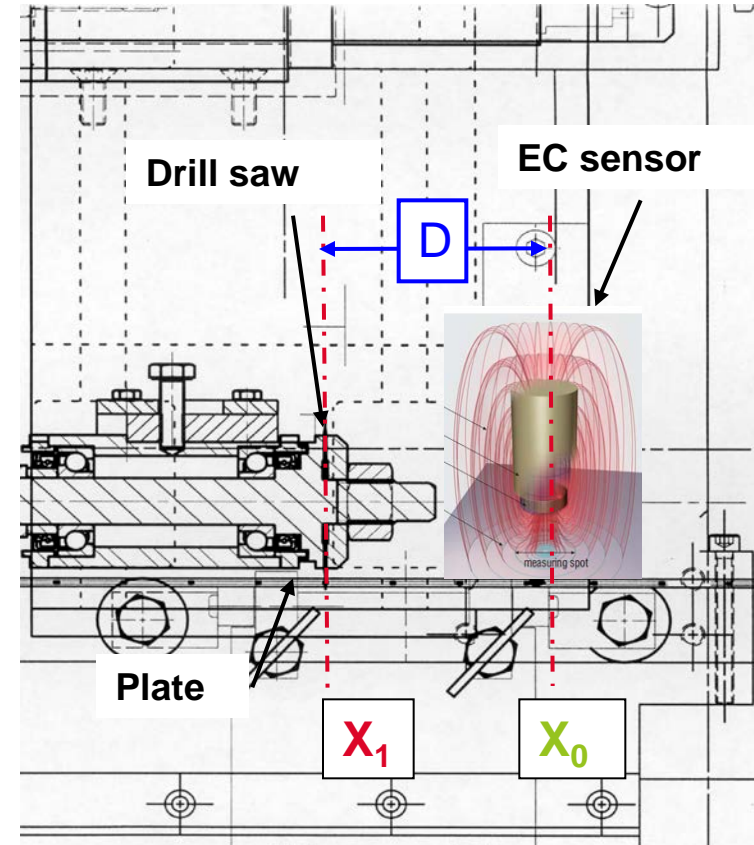
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III Cutting module/Eddy current location

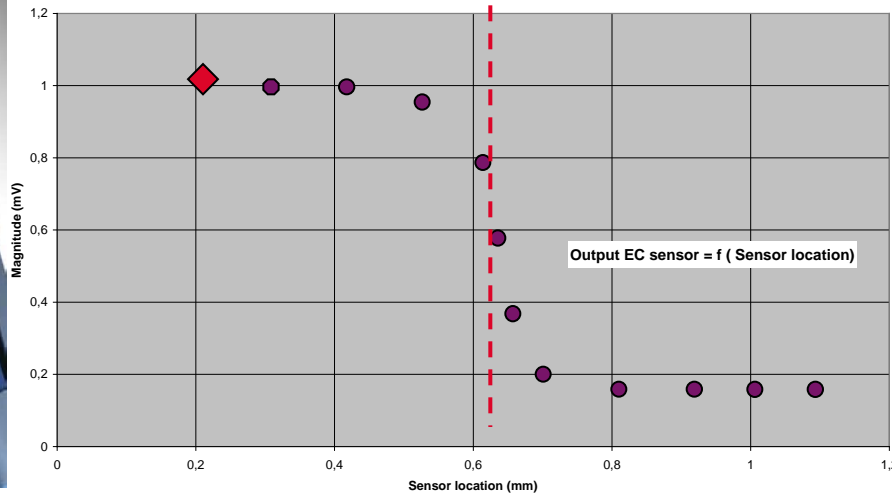
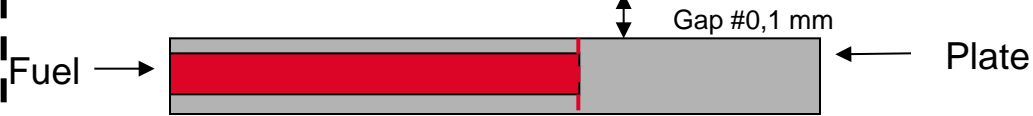
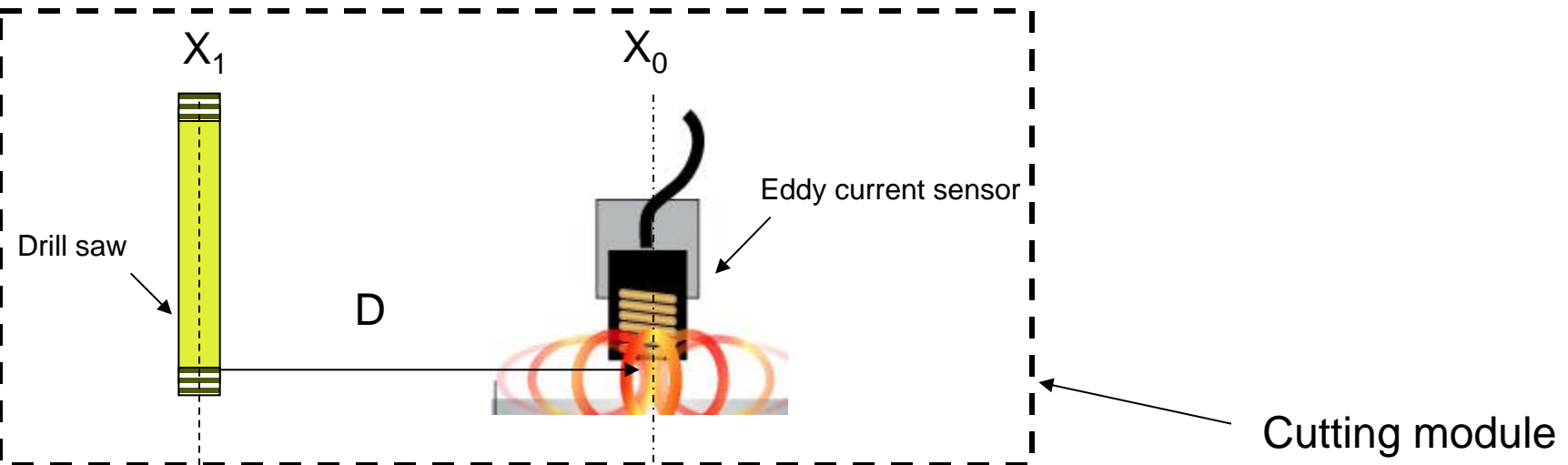


- This cutting module, although requiring intricate operations in a **hot cell** with specially adapted equipment and a very trained personnel, enables :
- (1) high-precision cutting (better than 0,1 mm)
- (2) a good reproductibility of the Eddy current signals has been observed

- 1°) Calibration is necessary to evaluate the cutting tool/E.C. sensor distance D . D is slightly different according to each sensor,
- 2°) Locating fuel edge by Eddy current technique X_0 ,
- 3°) Determinate exactly the cutting location $X_1 = X_0 + D$



III Cutting module/Eddy current location



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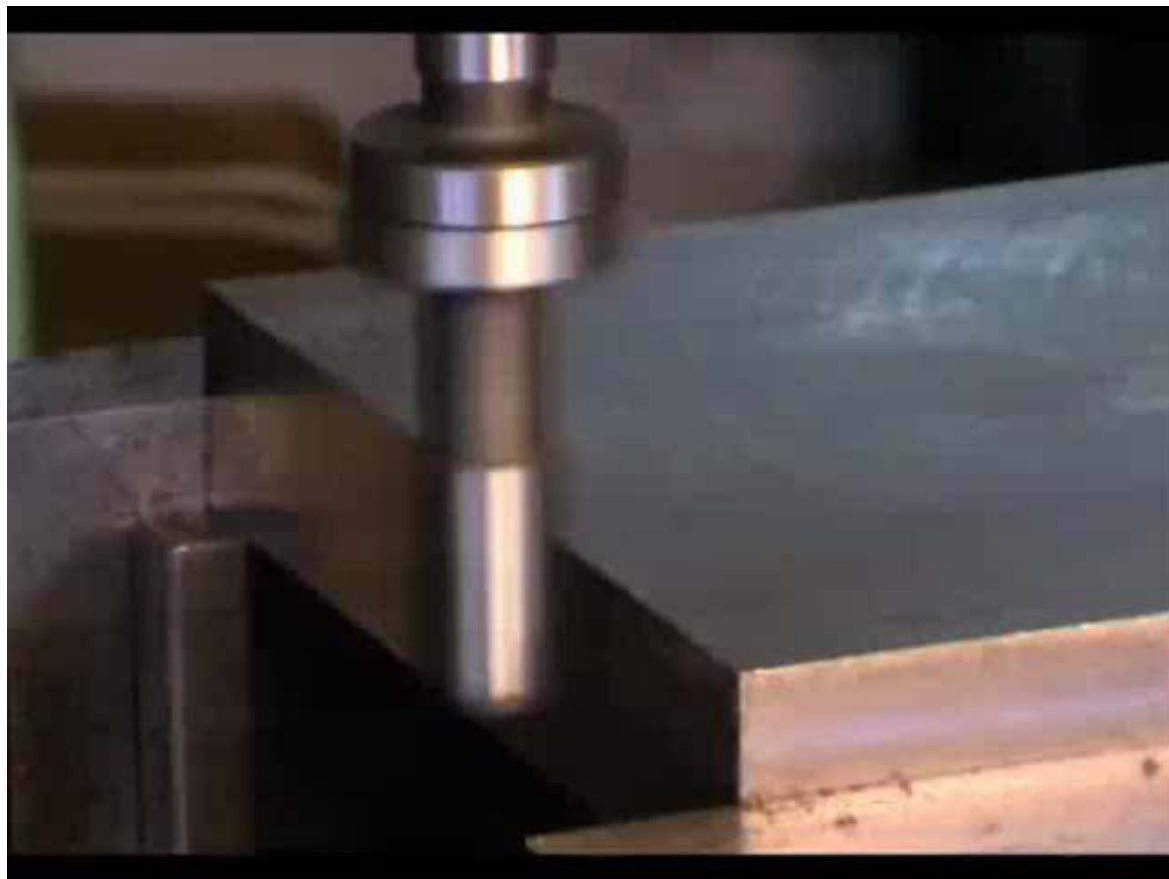
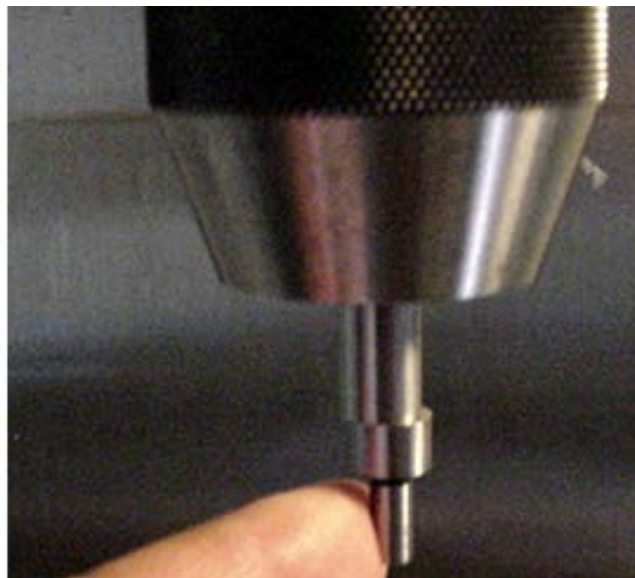
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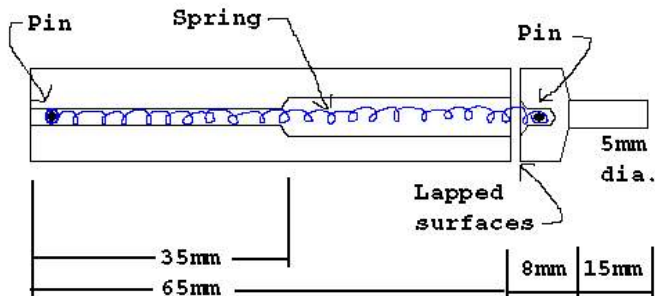
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IV Measurement module : Edge finder

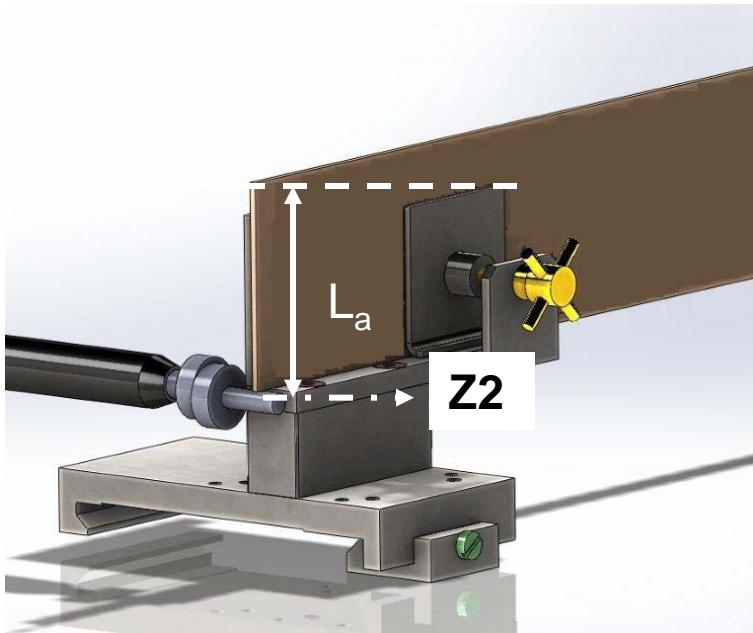
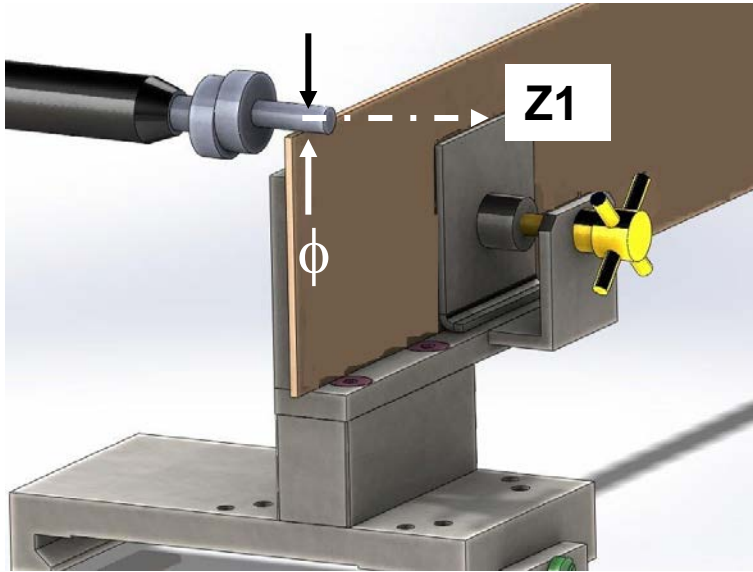


Edge Finder (Sketch)

(Made from 1/2" printer shaft)



IV Measurement module : Edge finder



↓
Z-axis

Φ diameter edge finder



$$\text{Plate length } L_a = Z_1 - Z_2 - \phi$$

Immediat advantage : no electrical connections

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- Multi-tasks PLACIDE I is always operating in LECA Facility after almost 13 years, mainly for cutting operations.
- **BUT....**
- The profilometry and spectrometry modules are out of service,
- Some secondary pieces are difficult to maintain in hot cells and need to be replaced,
- Obsolescence of electronic parts will make maintenance difficult and expensive,
- The controllers are no longer manufactured,
- Our stock of spare parts is limited,
- A working group has been formed to study a new bench that takes advantage of our feedback and new technologies,
- So, the project completion schedule envisages the commissioning of 3 benches :
 - *2 no destructive benches for september 2014,*
 - *1 cutting bench for june 2015.*



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