

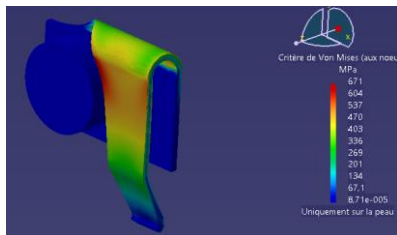
TITANIUM RING DEVELOPPEMENT

Fabrice Gallo – Pierre Karst - Daniel Labat – Stéphan Beurthey

HISTORY REMINDER

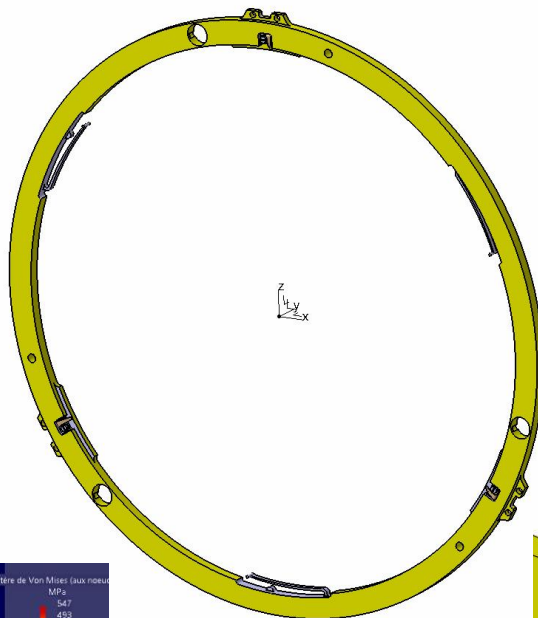
- **1st prototype outsourced (diameter 300mm)**
→ Aplanarity ~300 microns
- **2nd prototype with new machining strategy at CPPM**
→ Aplanarity ~30 microns
- **3rd prototype: In progress**
--> improvements in design and machining process

SUMMARY OF THE 200MM DISK DESIGN

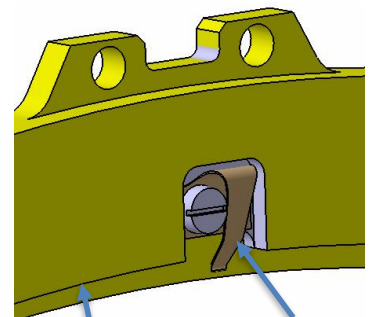


Stress axial fixation

Preload: 0,85N
K= 0,85N/mm



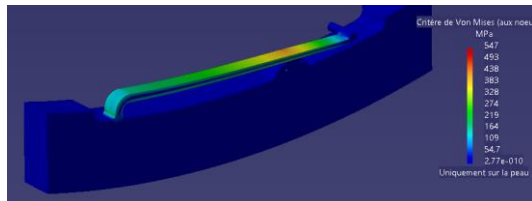
x 3



Disk pad

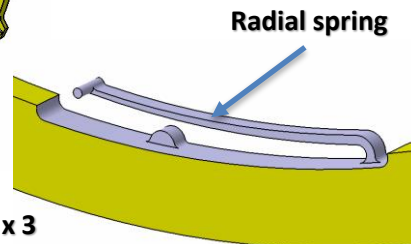
Axial spring

Stress radial fixation



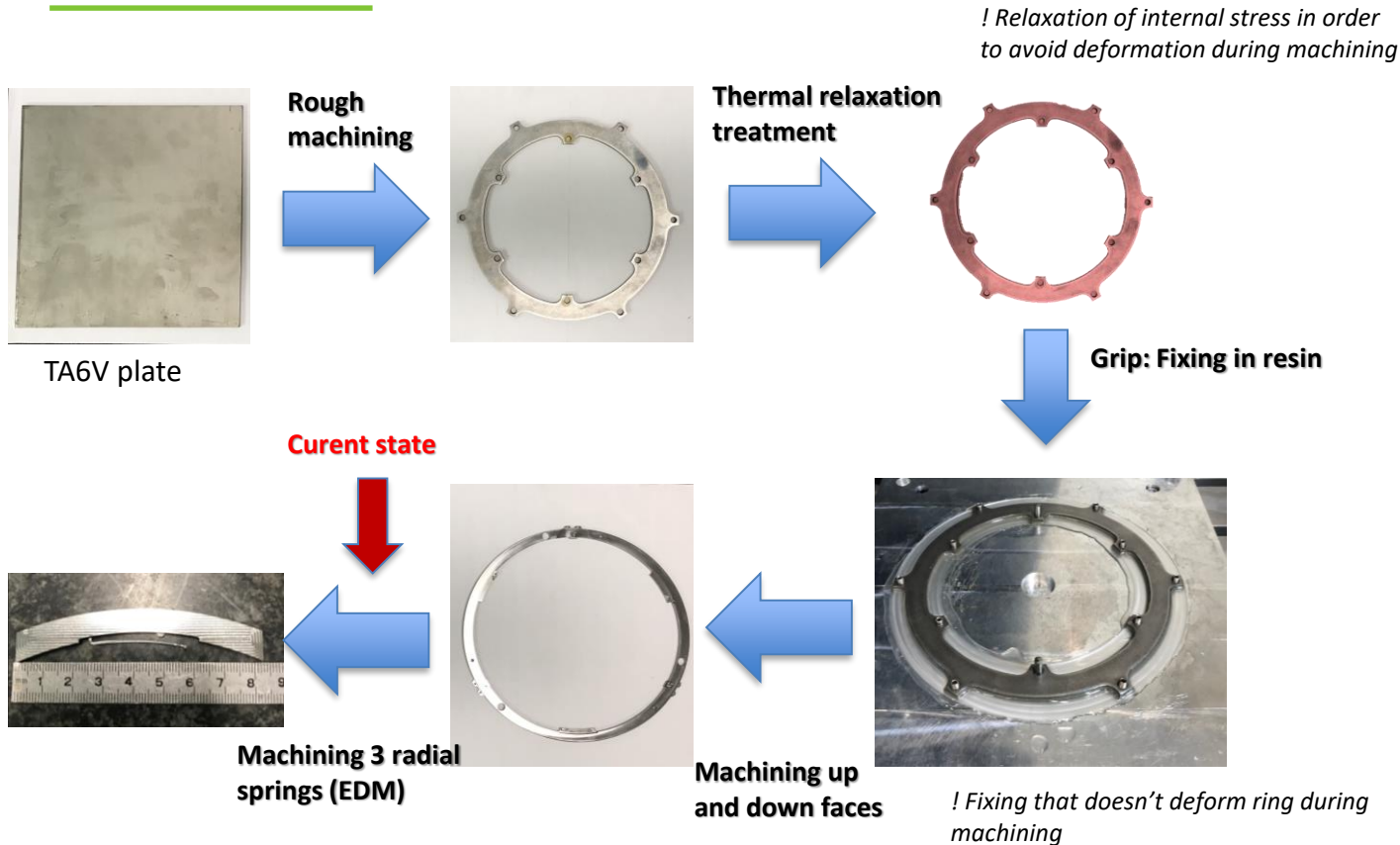
Preload: 2,5N
K= 1N/mm

x 3



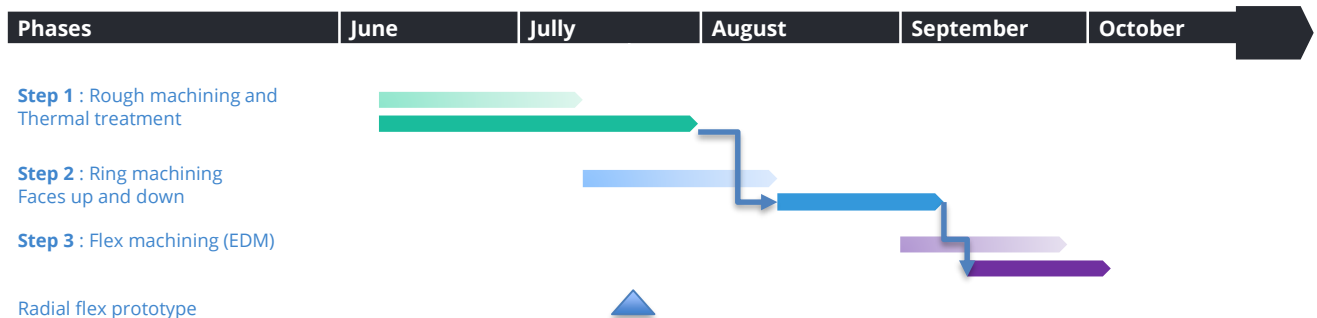
Radial spring

SUMMARY OF MACHINING PROCESS



RING PROTOTYPE STATUS

Planning

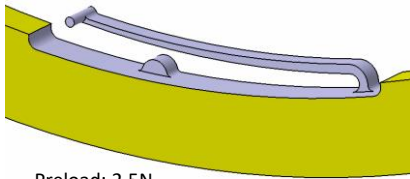


2 week delays on step 3 because of the thermal treatment
→ Ring delivery @CPPM: beginning of october

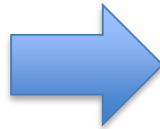
RING PROTOTYPE STATUS

Radial flex prototype

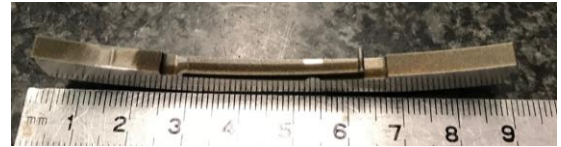
It is feasible!



Preload: 2,5N
K= 1N/mm
Disc weight ~ 230g



EDM prototype



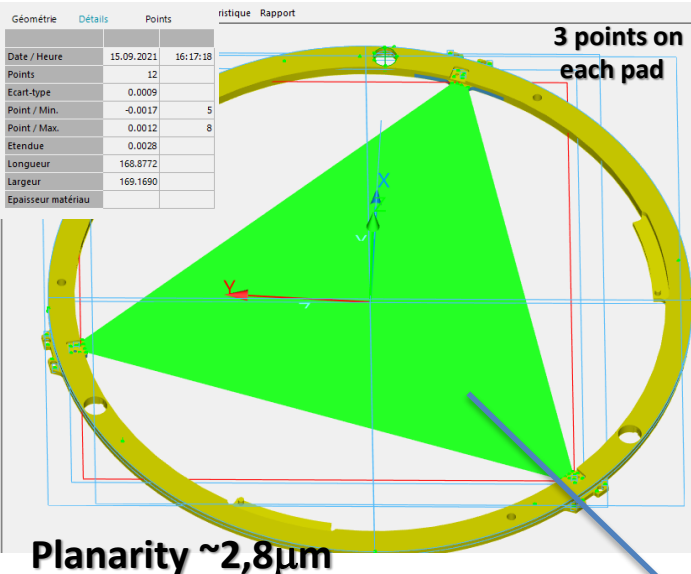
→ Spring characterisation in progress for end of september

RING PROTOTYPE STATUS

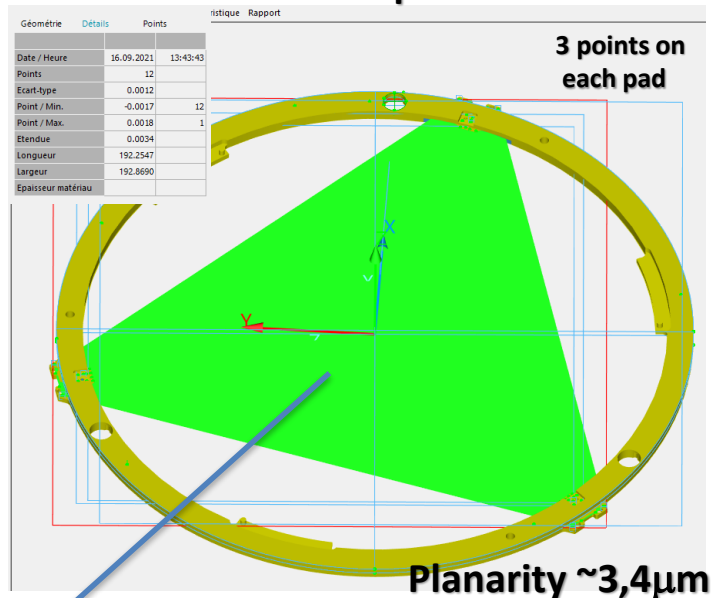


Step 2 machining : pads planarity

Disc pads



Motor pads



**Maximum gap between green surfaces (motor & disc pads) ~
Parallelism ~ 22µm**

DISC RING STATUS

- **Planarity of disc pads and motor pads are very good (less than 4 μm)**
- **Paralelism between motor interface and disc interface is 22 μm**
 - Difficult to do better with the current design!
 - Could it be corrected by close loop control on motor?
- **Final ring will be delivered to CPPM for full characterization beginning of October**
 - Characterization during October @CPPM with Saphir 230mm disc
- **Prototype cost: 3000€**
 - Step 1: Rough machining & thermal treatment: 900€
 - Step 2 : Done at CPPM – cost to be evaluated
 - Step 3 radial spring (EDM): 1500€
 - Axial spring + screw : 600 €

Work for cost reduction?

CONCLUSION

- **New machining process reach planarity goals (<10 μ m)**
- **Machining of spring is feasible**
- **A 200mm ring can be delivered in november**
- **Cost reduction study (on spring) is under way**
- **Next steps:**
 - To be defined in detail after full characterization
 - Validation of interface for a 300mm ring
 - *For 03/22?*