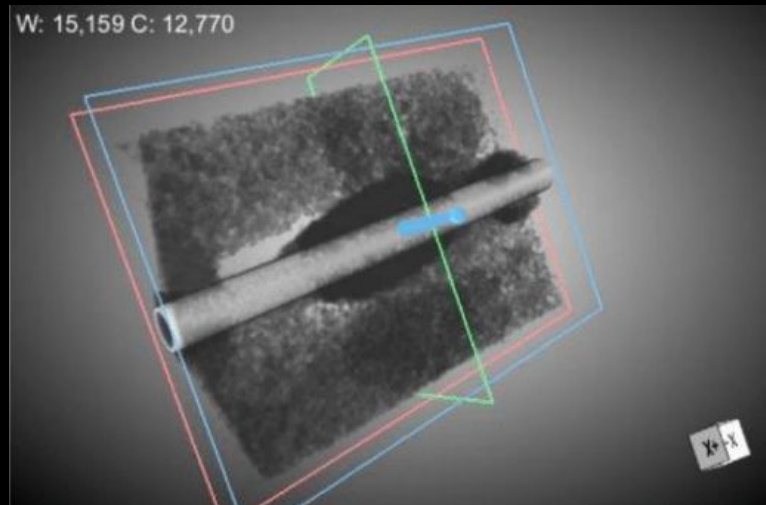
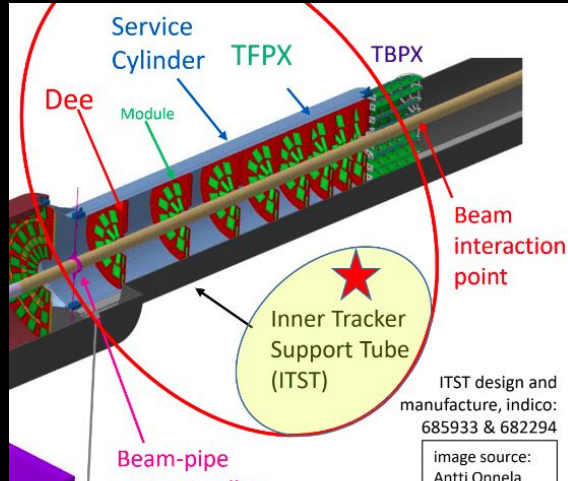
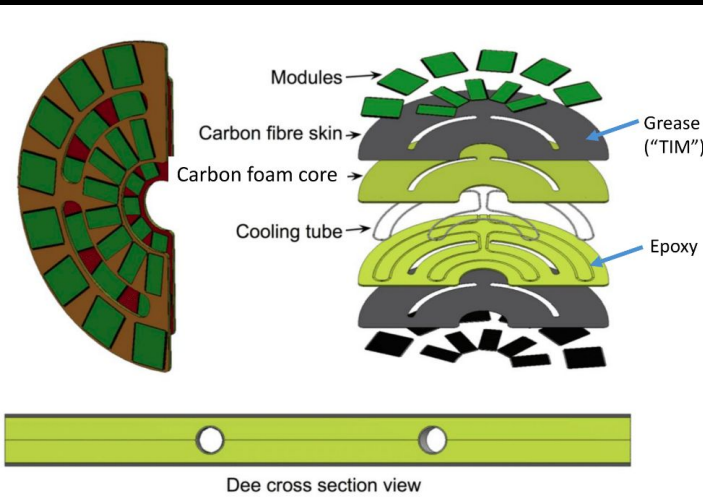


Research Overview

Timofei Babenko

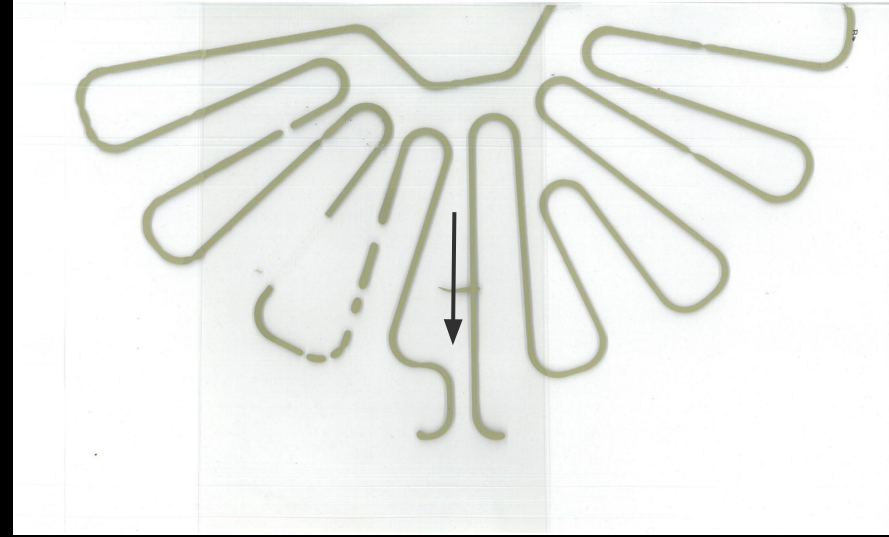
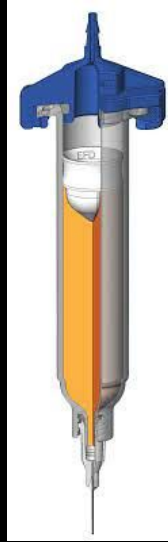
Mechanical Structure

- Carbon Foam
 - Cut the grooves into foam
 - Deposit epoxy into groove using a robot
- Put bendy tube into groove
 - Deposit another epoxy layer
- Sandwich carbon foam into carbon skin and modules
- Install Dees at CERN



Epoxy Deposition

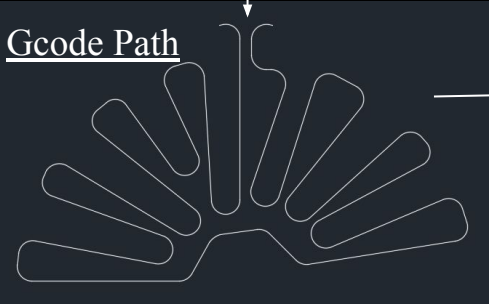
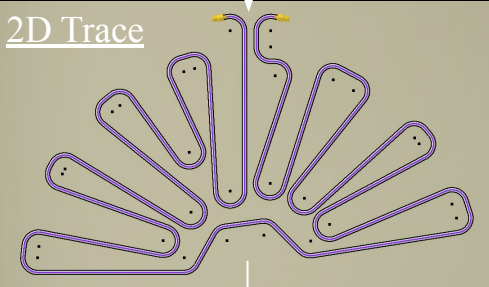
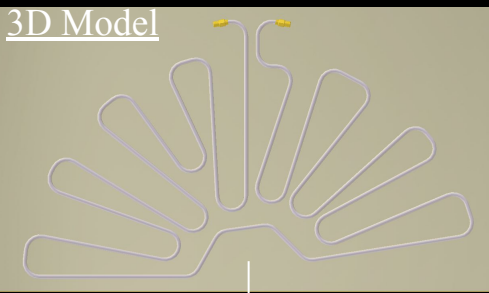
- Deposition of epoxy (glue) into a small groove on the carbon foam
- We use the gantry robot to deposit this into the groove because a human hand is imprecise.
- We made an epoxy in the lab mixed with moresco epoxy and diamond powder that cannot be found anywhere else for this procedure
- Helped by Marcos Acero



Gcode Pattern Creation

Converting a 3D Tube Pattern into Gcode

1. Import 3D DXF File into Inventor
2. Find the inside and outside traces of the 3D model
3. Take centerline of traces
4. Convert 2D centerline into Gcode using DXF2GCODE.
5. The Gantry slows on the bends; adjust speed to match the linear speed for consistency



2D	3D	GCode	About
201	G01	X-0.44429 Y0.690598	
202	G01	X-0.386223 Y0.724701	
203	G01	X-0.325562 Y0.753891	
204	G01	X-0.262695 Y0.778107	
205	G01	X-0.198082 Y0.796997	
206	G01	X-0.132134 Y0.810501	
207	G01	X-0.065277 Y0.818604	
208	G01	X0.001991 Y0.821198	
209	G01	X0.069267 Y0.818298	
210	G01	X0.136063 Y0.809799	
211	G01	X0.201942 Y0.796005	
212	G01	X0.26648 Y0.776794	
213	G01	X0.329216 Y0.752304	
214	G01	X0.38974 Y0.722794	
215	G01	X0.44764 Y0.688507	
216	G01	X0.502541 Y0.649506	
217	G01	X0.554054 Y0.606094	
218	G01	X0.60186 Y0.558701	
219	G01	X0.645584 Y0.507599	
220	F10		
221	G01	X43.98561 Y31.7502	
222	F60		
223	G01	X0.283402 Y0.212296	
224	G01	X0.275703 Y0.222199	
225	G01	X0.267593 Y0.231903	
226	G01	X0.259201 Y0.241211	
227	G01	X0.250504 Y0.250198	
228	G01	X0.241501 Y0.258987	
229	G01	X0.232201 Y0.267304	
230	G01	X0.222496 Y0.275406	
231	G01	X0.212601 Y0.283203	
232	G01	X0.2024 Y0.290497	
233	G01	X0.192101 Y0.297501	
234	G01	X0.181297 Y0.304092	
235	G01	X0.170502 Y0.310303	
236	G01	X0.159302 Y0.316208	
237	G01	X0.147995 Y0.321701	
238	G01	X0.136505 Y0.326691	
239	G01	X0.124901 Y0.331299	
240	G01	X0.112999 Y0.335602	
241	G01	X0.101097 Y0.339294	
242	G01	X0.088905 Y0.342804	
243	G01	X0.076797 Y0.345596	
244	G01	X0.0644 Y0.348206	
245	G01	X0.052101 Y0.350205	
246	G01	X0.039507 Y0.351808	

