**Light Boat Angle Regulator**

**Our Objectives**

- **Speed.** Our mechanism had to be as light as possible
- **Ease of access.** On land and on water
- **Robustness.** Resist a 150N force
- **Simplicity.** Lowest possible number of parts in case we need replacement.
- **Size.** Space was limited on the deck
- **Range of configurations.** Angle variation of ±3 degrees

**Design**

The mechanism is similar to those found on car jacks. We added four more rods in order to stabilize and remove rotation of our system.

We did a first version where all the parts where in INOX and with a M4 screw. When one of the pivots got jammed on the screw we identified two possible reasons:
- The poor contact between two INOX parts (screw and pivot)
- The buckling of the screw

We corrected it by having M5 screws on the new version and brass pivots

**Angle Reader**

In order to read the angle of inclination of the centerboard we came up with a system made of a detachable Dibond piece and permanently fixed supports.

**Structural Analysis**

- **Von Mises constraints**
- **Displacement**

With a 150 N force, the maximum constraint is 3MPa and the biggest displacement is 6 μm

**Production**

- **CNC:** Wedges and attaches to the boat cut into POM along with the angle reader.
- **ATME:** first prototype’s screws and guiding made out of INOX that broke because of a too small screw’s diameter and inappropriate Inox/Inox dynamic contact.
- **ATPR:** finals parts of our mechanism along with the connecting rods cut out by laser.
- **3D Print:** Support of the angle reader
- **Carbon:** Other secondary pieces were cut out in carbon

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