

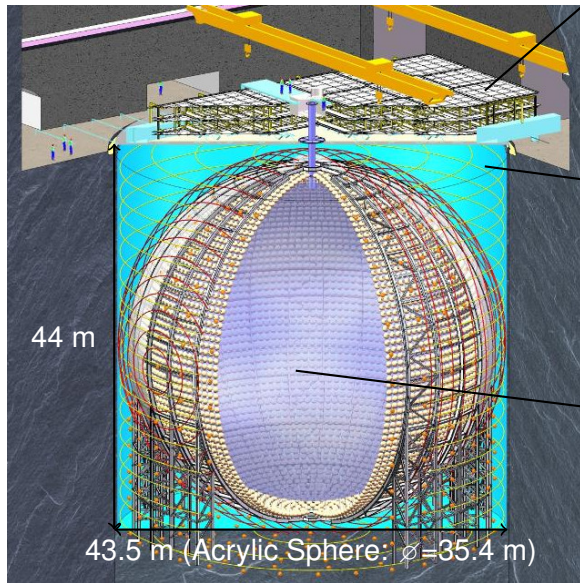
Status of the Veto System of JUNO

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IPHC/IN2P3/CNRS

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The JUNO Detector



Top Tracker (TT)

- Precise μ tracker
- 3 layers of plastic scintillator
- $\sim 60\%$ of area above WCD

Water Cherenkov Detector (WCD)

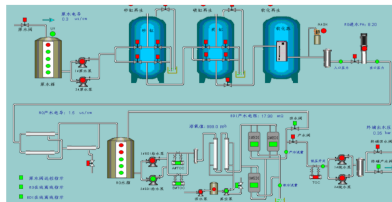
- 35 kton ultra-pure water
- 2.4k 20" PMTs
- High μ detection efficiency
- Protects CD from external radioactivity

Central Detector (CD) – $\bar{\nu}$ target

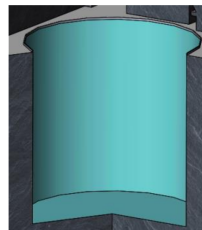
- Acrylic sphere with 20 kton liquid scint.
- 18k 20" PMTs + 26k 3" PMTs
- 3% energy resolution @ 1 MeV

Water Cherenkov Detector status

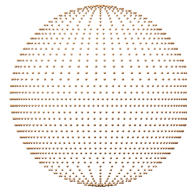
- Ultra pure water system:
 - ▶ Keep temperature and water quality
 - ▶ Start to install water pipes this year
 - ▶ 100 t/h system to be ready in 2021
- Bird cage: under production
- Liner:
 - ▶ Keep rock and water separate
 - ▶ Prevent Rn contamination from rock
 - ▶ Finishing installation tests
- Tyvek: same as Daya-Bay, prep. bidding
- Earth Mag. Field compensating coils:
 - ▶ reduce B on PMTs to $< 5 \mu\text{T}$
 - ▶ ready for production
- PMT: use 2.4k of JUNO's 20" PMT
- All components ready or in production



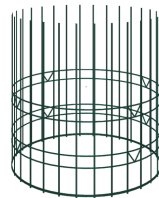
Pure water system, flow rate: ~100 t/h



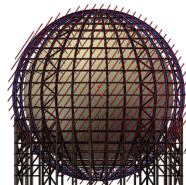
Pool liner



PMTs & Tyvek reflection film



Bird cage & Tyvek reflection film



EMF coils

Top Tracker (TT) status

- TT refurbished from OPERA Target Tracker
 - ▶ Detector granularity $2.6 \times 2.6 \text{ cm}^2$ in X–Y
 - ★ 0.2° median resolution for μ tracks
 - ▶ No aging of scintillator observed since OPERA
 - ▶ TT modules already delivered to JUNO site
 - ▶ Mechanical structure for TT re-designed
 - ★ ready to start mass production
 - ▶ New electronics chain
 - ★ FEB (w/ MAROC3): 1200 cards produced & tested
 - ★ ROB: design being finalised, review in 2020
 - ★ Concentrator (L1 trigger): testing prototype
 - ★ L2 trigger card: design just started

- TT will be on time for JUNO

