

# WP2 status

introduction

- WP2 is the Work Package dedicated to T2K detector upgrade and Neutrino Physics
- Recall of the main objectives:
  - Design, build, test and commission the upgrades for the T2K near detector (ND280), consisting of two TPCs and a scintillator based 3D Fine Grained Detector (Super-FGD).
  - Perfect the measurements of neutrino cross-sections, in particular to pin down nuclear effects and improve modelling.
  - Perform oscillation measurements with neutrinos and anti-neutrinos, both in appearance and disappearance, to maximize the sensitivity to leptonic CP violation.

# Tasks

- WP2 is organized in 4 tasks, 2 related to T2K upgrades, and 2 to analysis
  - Task 2.1: Construction and commissioning of the ND280 TPC [with participating institutes: INFN,CNRS,CEA,NCBJ,IFJ-PAN,IFAE,KEK]
  - Task 2.2: Construction and commissioning of the Super FGD [UGE,KEK,U-Tokyo]
  - Task 2.3: Neutrinos cross section measurement
  - Task 2.4: Neutrino oscillation analysis [INFN,CNRS,CEA,NCBJ,IFJ-PAN,IFAE,UGE,QMUL,KEK,U-Tokyo]

# Deliverables & Milestones

- Task 2.1 and 2.2
  - Deliverable: Technical Design Report of the upgraded ND280; EMD: 12
  - Milestone: production and test of first prototypes with front-end electronics; EMD: 24
  - Deliverable: report paper on the new detectors; EMD: 48
- Task 2.3
  - Milestones: improved selection acceptance for cross-section measurements, EMD 24; neutrino energy reconstruction using detectors at different off-axis angles, EMD 36
  - Deliverables: report on cross-sections on C and O and reduction of uncertainties, EMD 48; report on electron neutrino cross-section and reduction of uncertainties, EMD 48
- Task 2.4
  - Milestone: inclusion of multi-ring topologies in the event selection; EMD: 24
  - Deliverable: report on  $\delta$ CP sensitivity; EMD: 48

# Status of secondments

Institution	WP2 done (months)	WP2 planned	WP2 % done
INFN	6,9	49,0	14,1%
DESY		0,0	
OEAW-HEPHY		0,0	
IFJ-PAN	0,7	7,0	10,5%
UKP		0,0	
JSI		0,0	
METU		0,0	
TAU		0,0	
LAL-CNRS	1,2	9,0	13,7%
CEA	2,4	16,0	15,0%
IFAE	1,0	12,0	8,1%
UNIGE	1,6	18,0	9,1%
NCBJ	2,8	17,0	16,3%
KCL (Qmul)	0,0	3,0	0,0%
UKRI	0,7	6,0	12,2%
CAEN		0,0	
FBK		0,0	
<b>Total</b>	<b>17,4</b>	<b>137,0</b>	<b>12,7%</b>

# Comments

- WP2 secondments stopped ~ Feb 2020, less than one year after the start of the project
- Average usage of secondments was ~ 13% at the Jennifer2 suspension date, approx uniform across beneficiaries
- After a 2-year stop, it is expected that secondments for T2K upgrades will now ramp up quite rapidly during the next > 2 years
- We are now approaching the installation and commissioning phase
- Milestones and deliverables foreseen at this phase of the project are met → see next presentations for more details