DUNE status and perspectives

Report for the meeting of the Conseil Scientifique de l'IN2P3 :

Neutrinos réacteurs et accélérateurs 28-29 Juin 2018

(Addendum to the report)

Part 1: The following table provides a snapshot of the human resources currently involved in the project

APC:

Physicists: Jaime Dawson, Thomas Patzak, Alessandra Tonazzo

Engineers/Technical personnel: Cayetano Santos

PhD students: Andrea Scarpelli

IPNL:

Physicists: Dario Autiero, Slavic Galymov, Jacques Marteau, Elisabetta Pennacchio, + Postdoc currently under recruitement

Engineers/Technical personnel: Edouard Bechetoille, Bruno Carlus, Fabien Doizon, Claude Girerd, Herve Mathez, Denis Pugnere, William Tromeur

PhD students: Thomas Kosc

LAL:

Physicists: Mathieu Bongrand, Fabien Cavalier, Joao Coelho, Laurent Simard

Engineers/Technical personnel: Christian Bourgeois, Denis Douillet, Eric Guerard, Rodolphe Marie

LAPP:

Physicists : Isabelle Debonis, Dominique Duchesneau, Yannis Karyotakis, Laura Zambelli

Engineers/Technical personnel: Benjamin Aimard, Gael Balik, Laurent Brunetti, Nicolas Geffroy, Fabrice Peltier, Cyril Drancourt, Jean-Marc Nappa, Sebastien Vilalte

PhD students: Anne Chappuis

OMEGA:

Physicists : Gisèle Martin-Chassard, Christophe de La Taille, Selma Conforti

In general, the IN2P3 participation to DUNE is increasing. The LAL group joined recently. The list presented above (42 participants, about half of them physicists) does not include yet people involved in the beam activities from LAL and IPNO.

Part 2: Summary of the funding contributions to ProtoDUNE dual-phase/DUNE

The French groups have long standing contributions to all the process which has been contributing to the preparation for DUNE via the R&D programs and the LAGUNA/LAGUNA-LBNO European projects. The R&D program on the analog cryogenic electronics and the digital readout electronics started in 2006 and benefited of a constant support in terms of manpower and R&D funding. The direct funding to DUNE started with WA105 (now ProtoDUNE-DP). A CERN MOU (addendum 4 to the Memorandum of Understanding for Collaboration in the Neutrino Program) which was finalized in 2015 defined the IN2P3 and CEA/Irfu participation to WA105/protoDUNE-DP. The IN2P3 groups have actually been contributing to ProtoDUNE-DP in terms of core costs (525 keur) for more than what was originally foreseen by the MOU (375 keur) and have been providing additional hardware resources (thanks to storage servers/DAQ servers/computing nodes provided by CCINP3) in order to build the ProtoDUNE-DP DAQ back-end and the online computing/storage system. The following table summarizes the core-costs contributions and technical manpower contributions of the this last phase since 2012 until 2018. This table does not include investments and contributions from the LAGUNA/LAGUNA-LBNO programs.

Phase		Year	Hardware	person.year Engineers & Technicians	E&T salaries	Source of funding	Further information
R&D		2006-2013	300 000 €	1,5	112 500 €	Univ. Lyon funding (Labex LIO)	Cryogenic and Integration Facility: Liquid Argon (CCIF-LAR)+
				24	1 800 000 €	IN2P3	Design of cryogenic ASIC amplifier+FE cards
		Sub-total	**300 000 €**	**25,5**	**1 912 500 €**		
WA105/ Proto-DUNE-DP	WA105 MOU	2014	45 000 €	7	525 000 €	IN2P3	
		2015	100 000 €	8	600 000 €	IN2P3	
		2016	200 000 €	11	825 000 €	IN2P3	
		2017	130 000 €	9	675 000 €	IN2P3	
		2018	50 000 €	9	675 000 €	IN2P3	
		Sub-total	**525 000 €**	**44**	**3 300 000 €**	**IN2P3**	
		2015-2018	165 000 €	10	750 000 €	CEA	
		Sub-total	**165 000 €**	**10**	**750 000 €**	**CEA**	
		travel@CERN (2014-2018)	238 000 €			IN2P3	
		in-kind computing	200 000 €			IN2P3	x25 storage servers DELL R510+MD1200 for 1.8PB
		additional support	50 000 €			Institut Universitaire de France	
		additional support	30 000 €			Univ. Lyon funding (Labex LIO)	spent on WA105 electronics
		additional support	208 000 €			CEA	WA105 non-core at Saclay
		Total	**1 416 000 €**	**54**	**4 050 000 €**		
Grand total			**1 716 000 €**	**79,5**	**5 962 500 €**	**French contribution to Liq. Ar. Dual Phase TPC R&D (2006-2018)**	