



Status and Plans of the EUROν Neutrino Factory workpackage



EURO ν - WP 3 and the IDS



The EURO ν - WP 3 is an integral part of the international design effort IDS-NF

Aims:

- To integrate additional EU partners into IDS
- End to end simulation (target to decay rings) for performance and cost evaluation.
- Proton beam handling after target & safety issues



IDS - aims



- To deliver an interim design report until 2010
with a first costing to be 50-70% accurate
- To deliver a reference design report until 2012
End to end simulations of muon linac
Performance evaluation of facility
costing to be 30-50% accurate

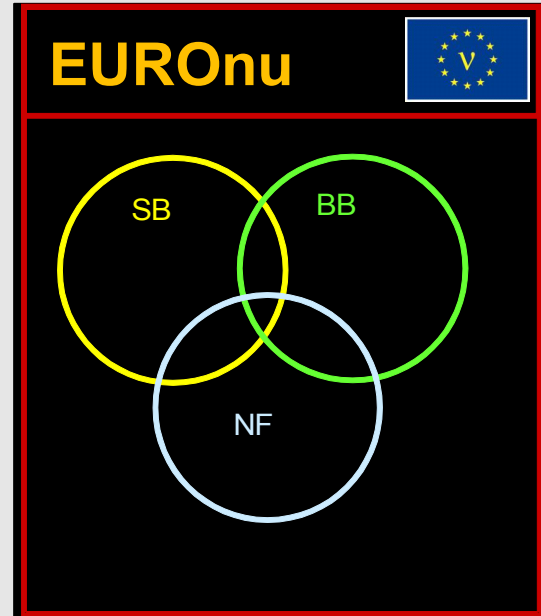


Organisation



IDS-NF

- **The Americas**
 - Canada
 - USA
- **Asia**
 - Japan
 - India
 - (in the future: China ...)
- **Europe**
 - EUROnu



International Design Study of the

Neutrino Factory

Steering Group

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Physics and Performance Evaluation:

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Accelerator:

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Detector:

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EUROnu				
Management Board	Project Coordinator	Super-Beam	Neutrino Factory	Beta Beam
		Edgecock	Dracos	Long
WP	Coordinator		Deputy	
1	Edgecock (STFC)		nya	
2	Zito (CEA)		Densham (STFC)	
3	Pozimski (ICL)		TBC	
4	Benedikt (CERN)		Fabich (CERN)	
5	Soler (Glasgow)		Cervera (Valencia)	
6	Hernandez (Valencia)		Donini (Madrid)	



WP3 - Milestones



Milestone	month (from start Sept. 2008)
Evaluation of baseline front-end	15
Evaluation of acceleration systems	18
Evaluation of performance of alternative cooling and acceleration	24
Specification of proton-beam handling system	24
Benchmark costing for muon front-end and acceleration systems	30
Initial health-and-safety evaluation of proton-beam handling system	38
Cost and Performance evaluation complete	40
Comparison of physics performance of all facilities	43



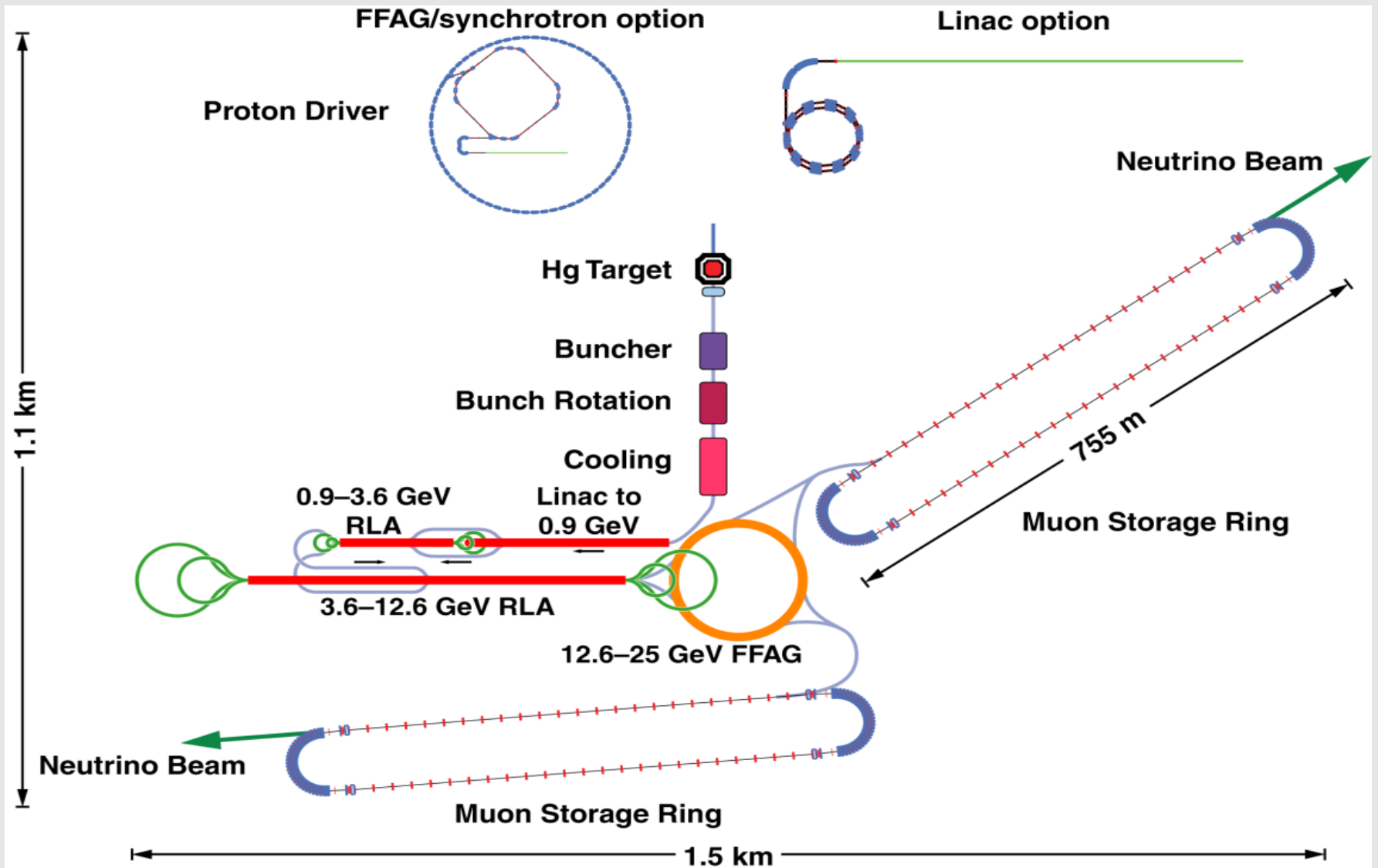
WP3 - Deliverables



- 1 Completed review of ionisation-cooling and muon front end
Dec 2009
- 2 Completed review of muon acceleration
March 2010
- 3 Completed simulation of baseline and alternative ionisation-cooling channel, including a cost and performance analyses for reference muon front end.
Dec 2010
- 4 Completed simulation of baseline and alternative muon acceleration system and the decay rings and evaluation of reference design for spent proton-beam handing system, including a cost and performance analyses.
Oct 2011
- 5 Complete end-to-end simulation and evaluation of the performance of the Neutrino Factory as input to the comparison
Feb 2012



The IDS baseline-overview





Proton driver & Target



- R&D for the proton driver is decoupled from IDS as a hosting lab specific solution is assumed,.....but required beam parameters on target have been defined.

Proton driver work concentrates on:

- CERN LINAC 4 / SPL EUROv WP2 (& bunch compression)
- Fermilab Project X
- RAL - ISIS upgrade & greenfield

Target :

Target work is performed mainly in EUROv WP2 in collaboration with WP3. Work concentrates on shock studies and solid target and fluidised powder.



Capture, Phase rotation and cooling



- Determination of usable yield done
- revision using HARP data started 21 month
- Lattice design done
- Particle Tracking 1 done
- PT 2 started 6 month
- Pre engineering of RF and magnets 16 month
- End to end simulation 31 month
- Costing of components 21/39 month

EURO_v contributions started with yield simulations performed with FLUKA and investigations of alternative lattices.



Fast acceleration – Linac / RLA



- Lattice design done
- Particle Tracking 1 done
- Particle Tracking 2 started 9 month
- Pre engineering of modules and magnets 16 month
- Costing of components 21/39 month

EUROv members performed benchmark between MADX and OPTIM on linac and started EM design of magnets and cavities.



Fast acceleration - FFAG



- Lattice design mainly done
- Injection & extraction started 9 month
- Particle Tracking 1 21 month
- Particle Tracking 2 21 month
- Pre engineering of RF and magnets 16 month
- Costing of components 21/39 month

EUROν contributions on fields of lattice design and beam extraction.



Decay rings



- Lattice design done
- Particle Tracking 1 started 6 month
- PT 2 started 6 month
- Pre engineering of magnets 16 month
- Definition of beam diagnostics 21 month
- End to end simulation 31 month
- Costing of components & rings 21/39 month
- Scaling and costing for LENF 33 month

EUROv contributions on fields of particle tracking (debunching) and beam diagnostics.



Summary



- Eurov started
 - in person WG3 meetings aligned with IDS
 - recruitment and coordination tasks finished
- IDS
 - Tasks and partners identified
 - Main issues identified and work started
 - Work focuses on problems to be solved for a design report in 2010 / 2012

Next Meetings :

Nufact (Chicago, July 2009)

IDS plenary meeting (12-14 October 2009 at the Tata Institute, Mumbai)

+ additional telephone meetings (next in September 2009)

+ individual exchange on specific subjects