THE EURONU PROJECT

A HIGH INTENSITY NEUTRINO FACILITY IN EUROPE

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Deputy Convener of Working Package 6 (Physics)

WHAT IS EURONU?

- EUROν is a cooperative project funded by the European Union within the 7th Framework Programme (Infrastructures)

- 15 institutions participate (5 in the UK, 2 in France, one each for other seven EU countries, plus CERN), plus some external institutions

WHAT IS EURONU?

Mandate

This Design Study will review all three currently accepted methods of realizing this facility (the so-called neutrino Super-Beams, Beta Beams and Neutrino Factories). [...] The construction of such a facility in Europe would reassert Europe's position as the leading region for high energy particle physics.

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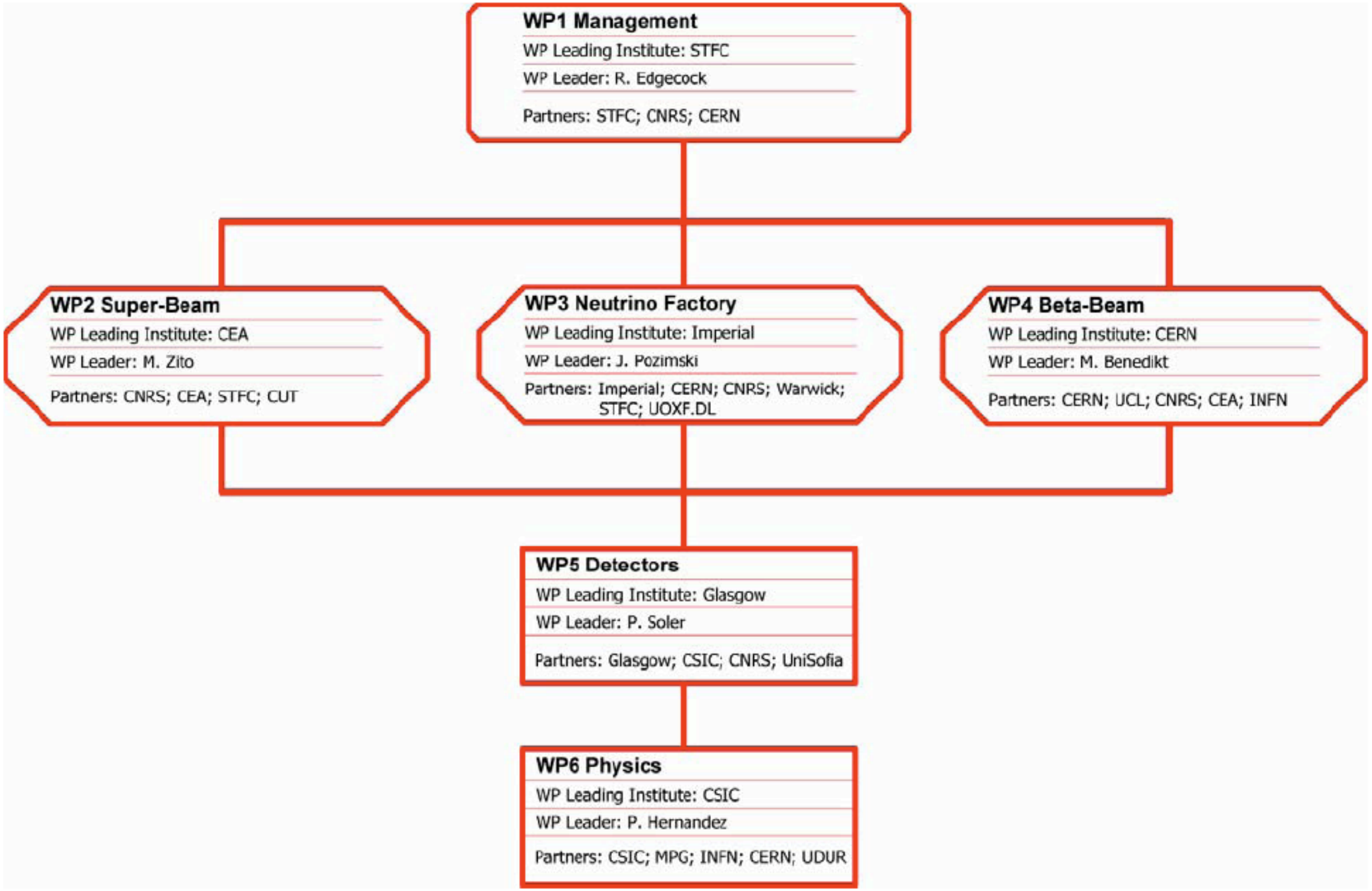
2012, end of project

EURONU STRUCTURE



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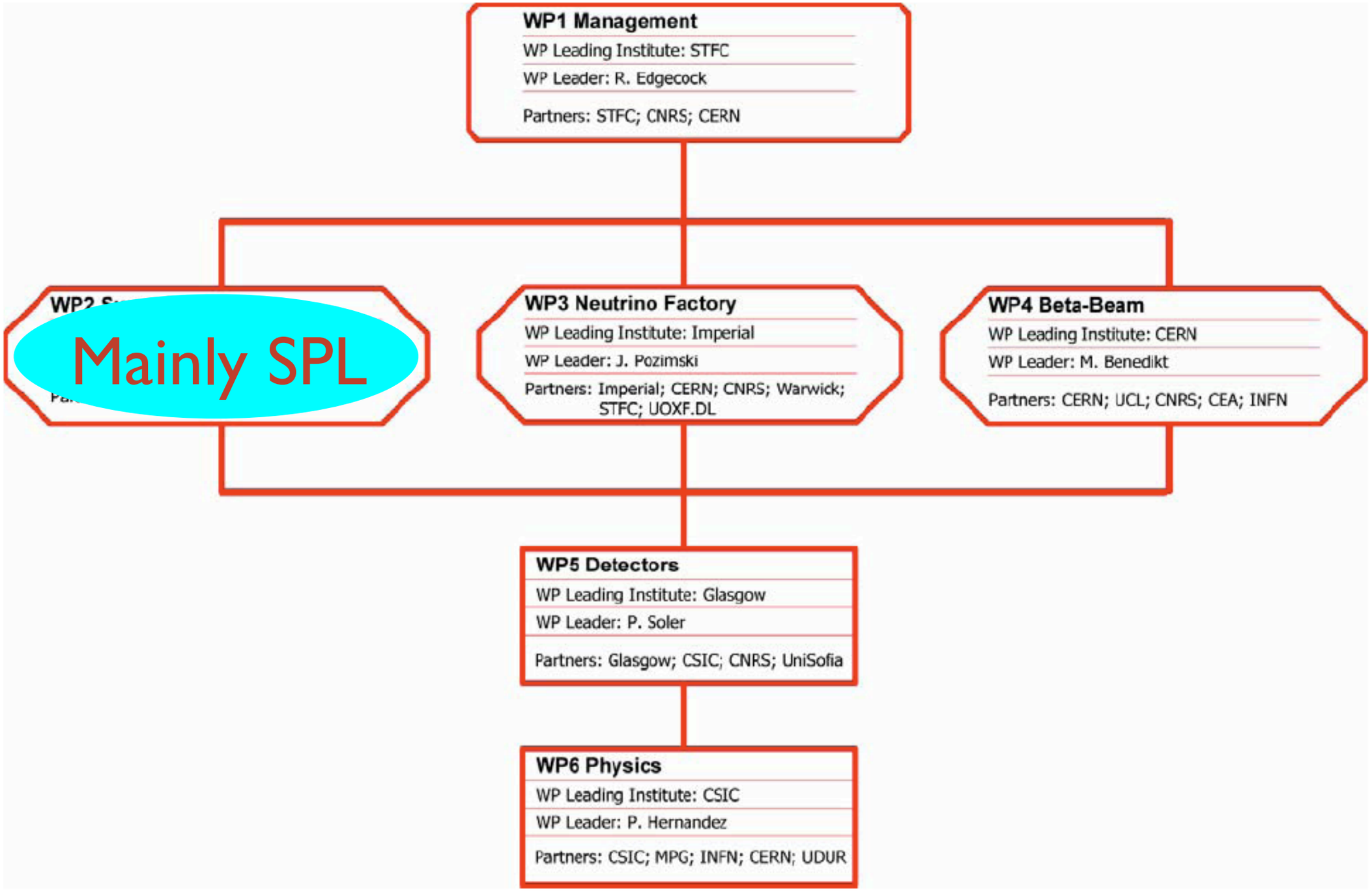

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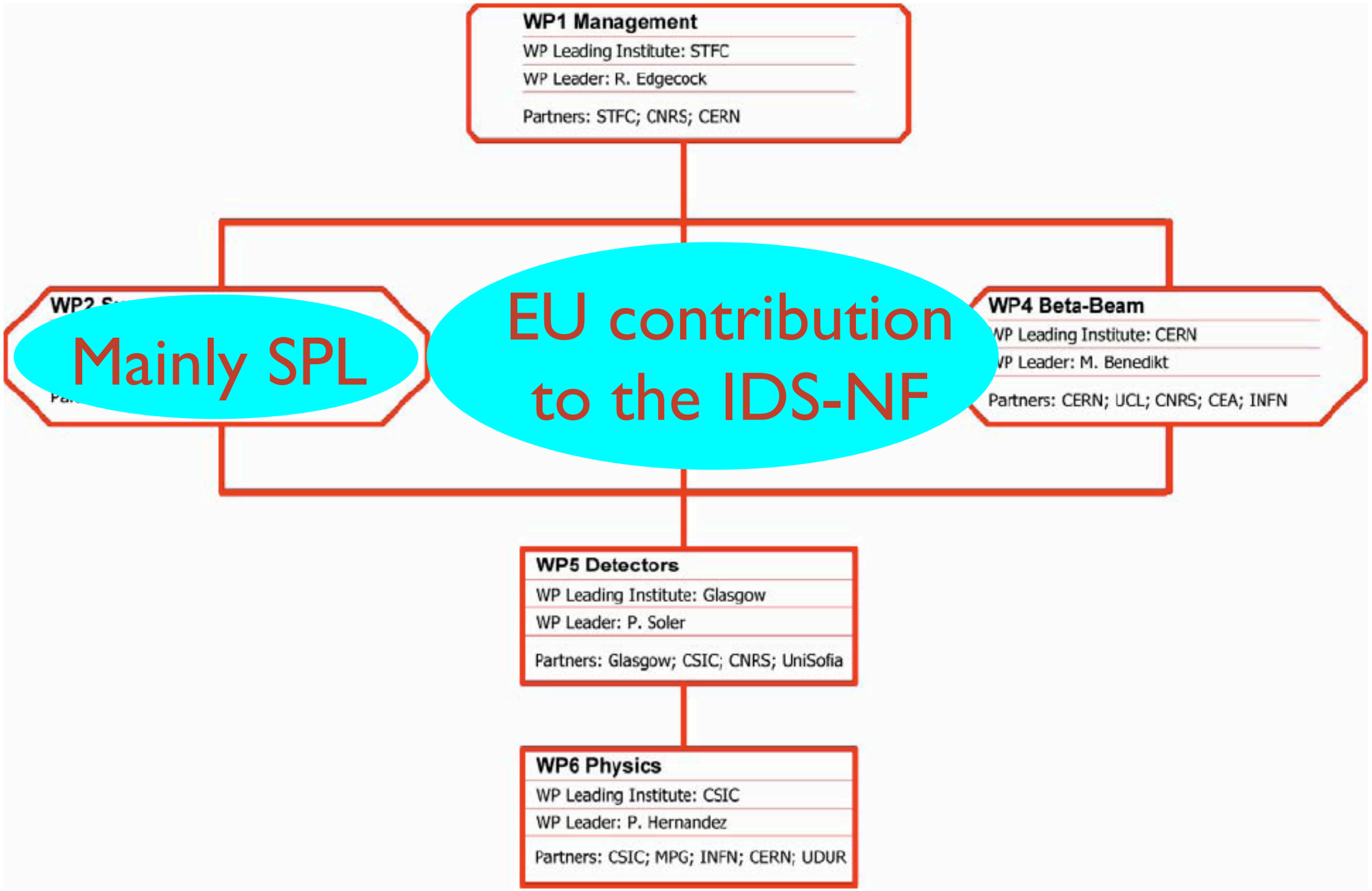

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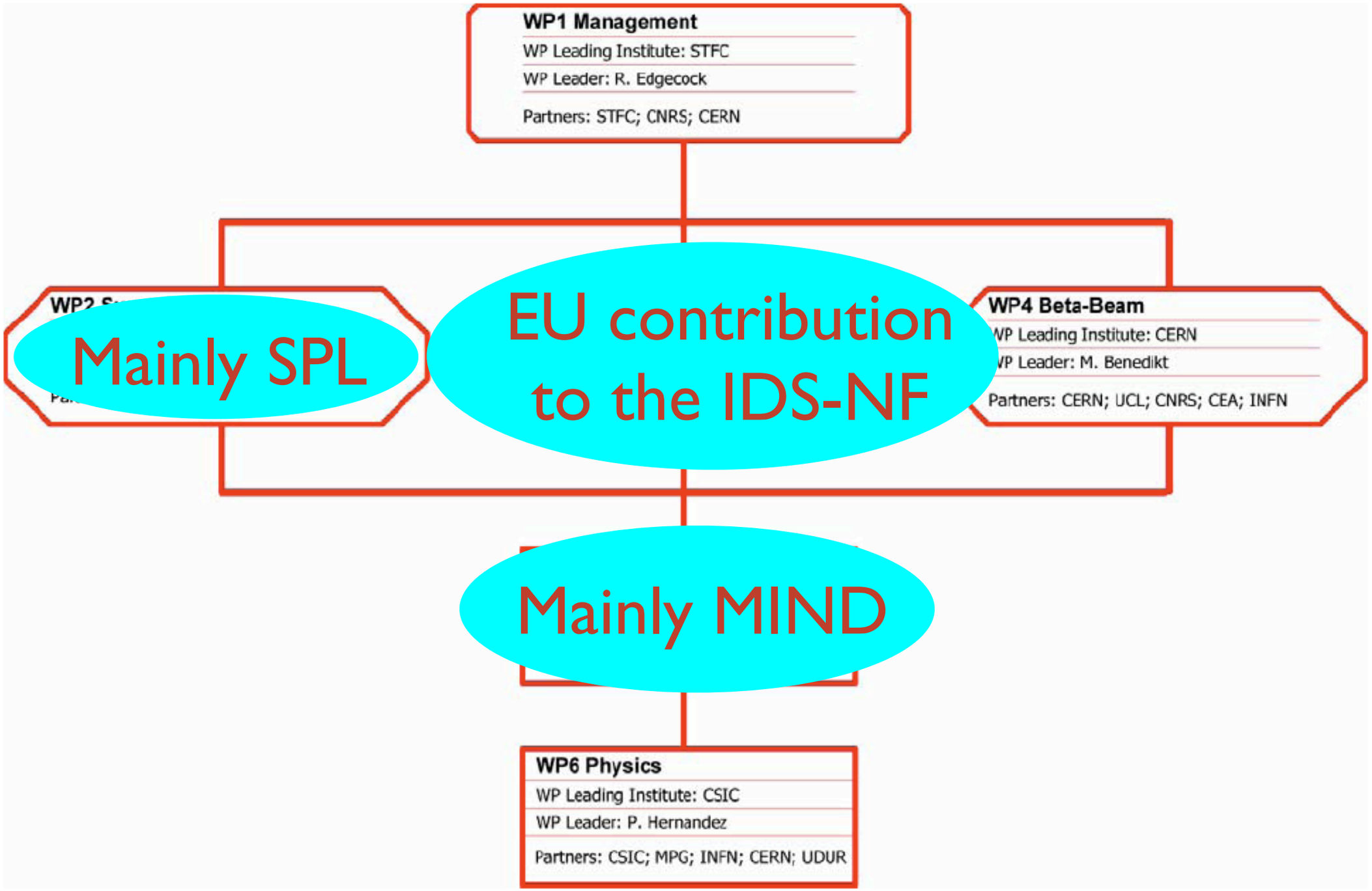

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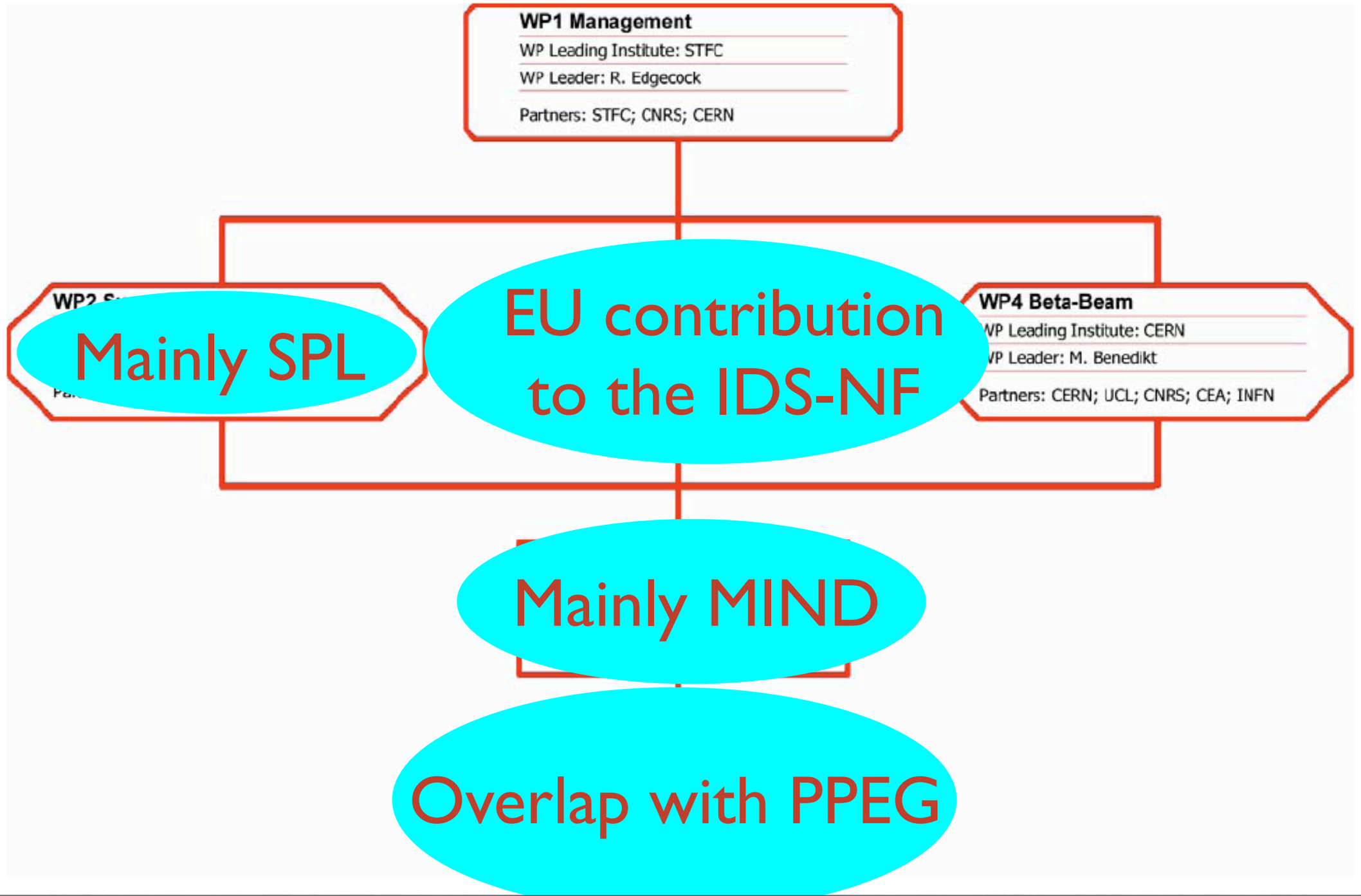

ONCOMING MILESTONES

WP2

- Design of target station, 06/11
- Report of neutrino beam intensity, 07/11

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WP3

- Costing and performance evaluation, 05/11
- Initial health and safety evaluation, 03/11

ONCOMING MILESTONES

WP4

- Baseline scenario, STILL TO DO: MANY IDEAS
- Full simulation of production ring, 12/10

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WP5

- Choice of optimal detectors for all fac's, 12/10
- Comparison of detectors performances, 05/11

ONCOMING MILESTONES, WP6

Unified treatment of systematics (end of 2009!)

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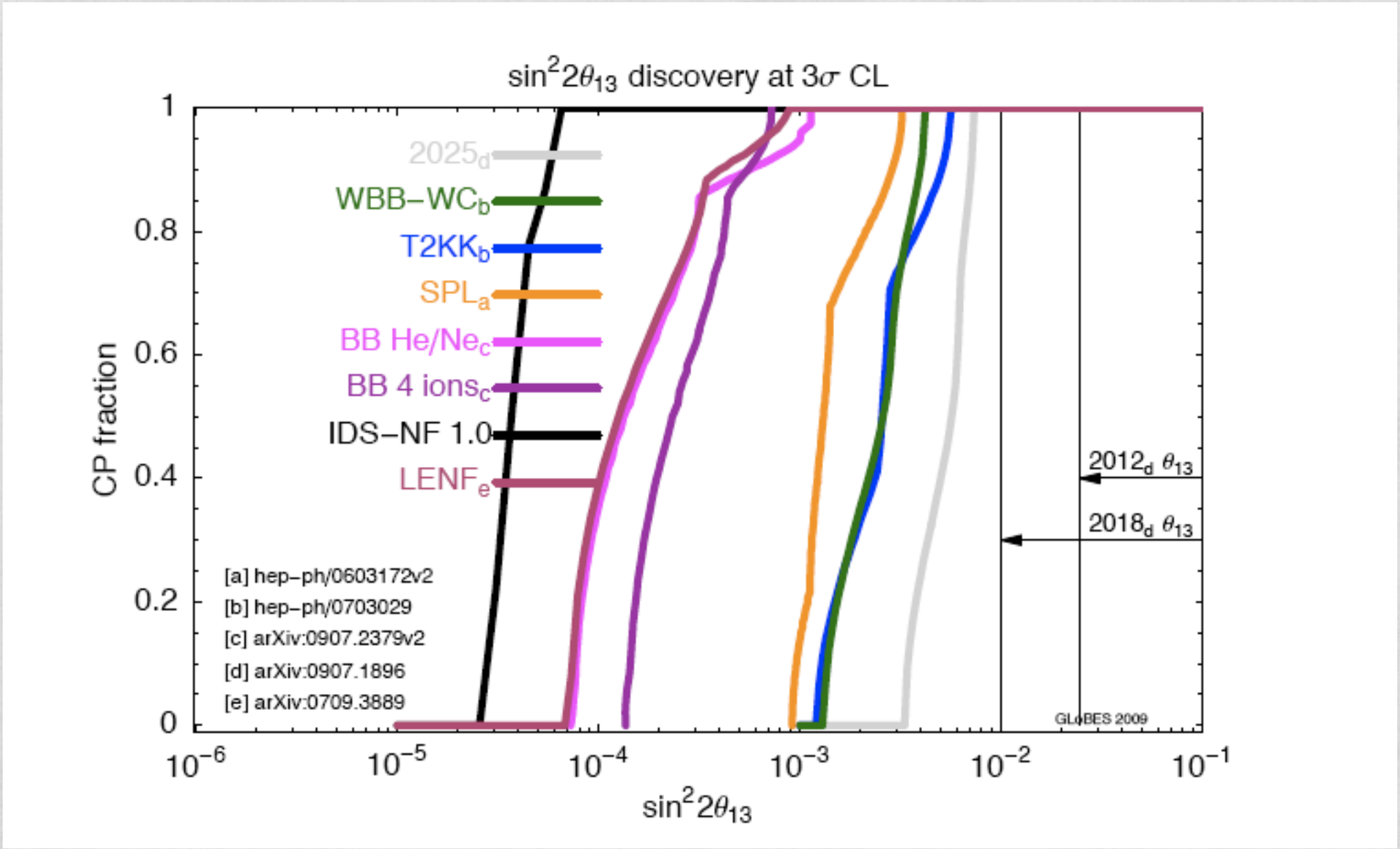
Impact of flavour physics measurements (end of 2010)

some work done within the WP in the context of searches for new physics
beyond standard three-family oscillations

PRIMARY WP6 ACTIVITY

- Our primary role in EUROnu is the comparison of the physical performances of all the facilities, with updates as soon as new inputs are available
- Latest comparison available in the arXiv can be found in the WP6 2009 Yearly Report, arXiv:1005.3146
- Comparisons are usually shown in terms of sensitivity to θ_{13}, δ and to the mass hierarchy (preferred observables, chosen at ISS)

MIXING ANGLE



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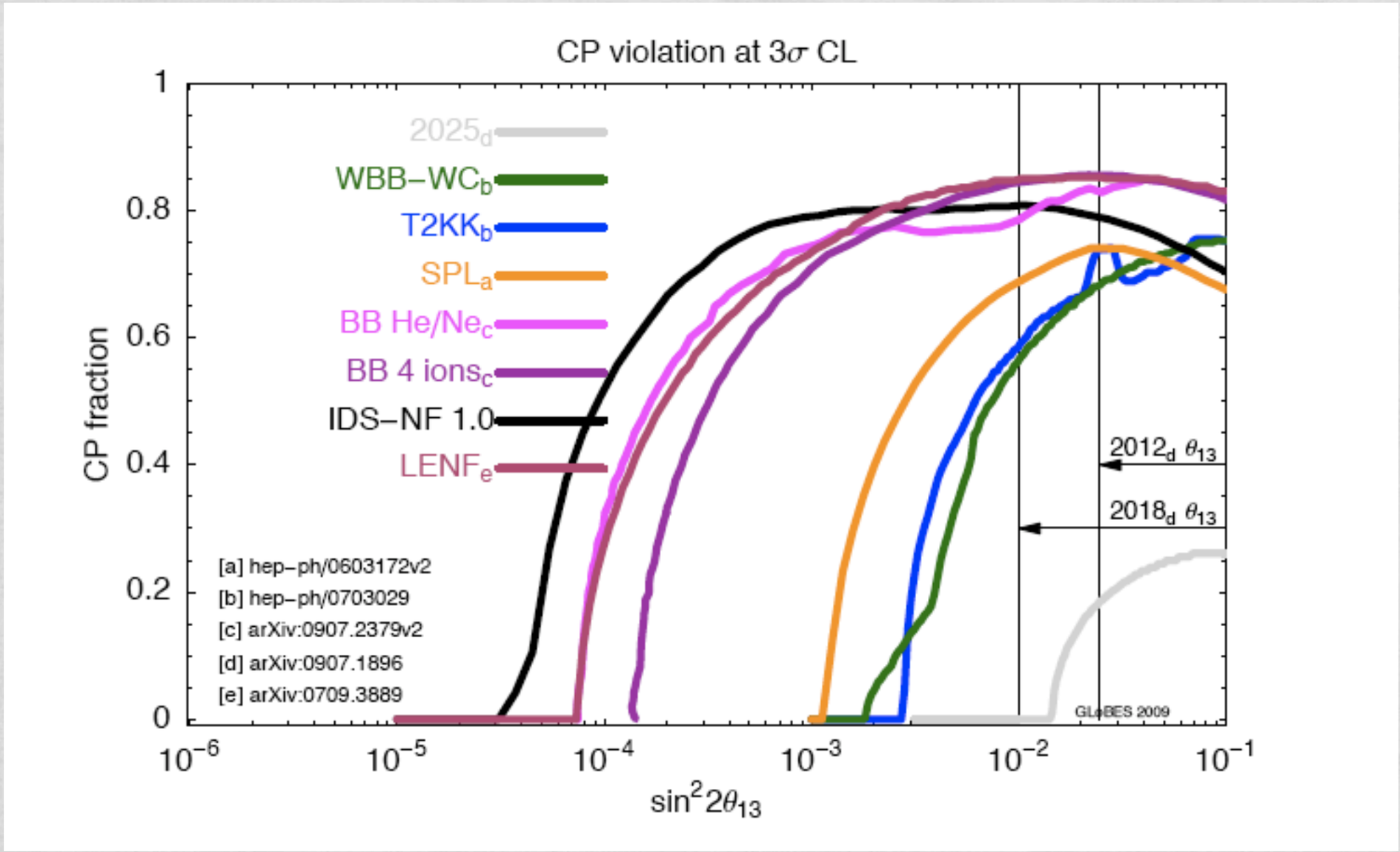
CP VIOLATING PHASE



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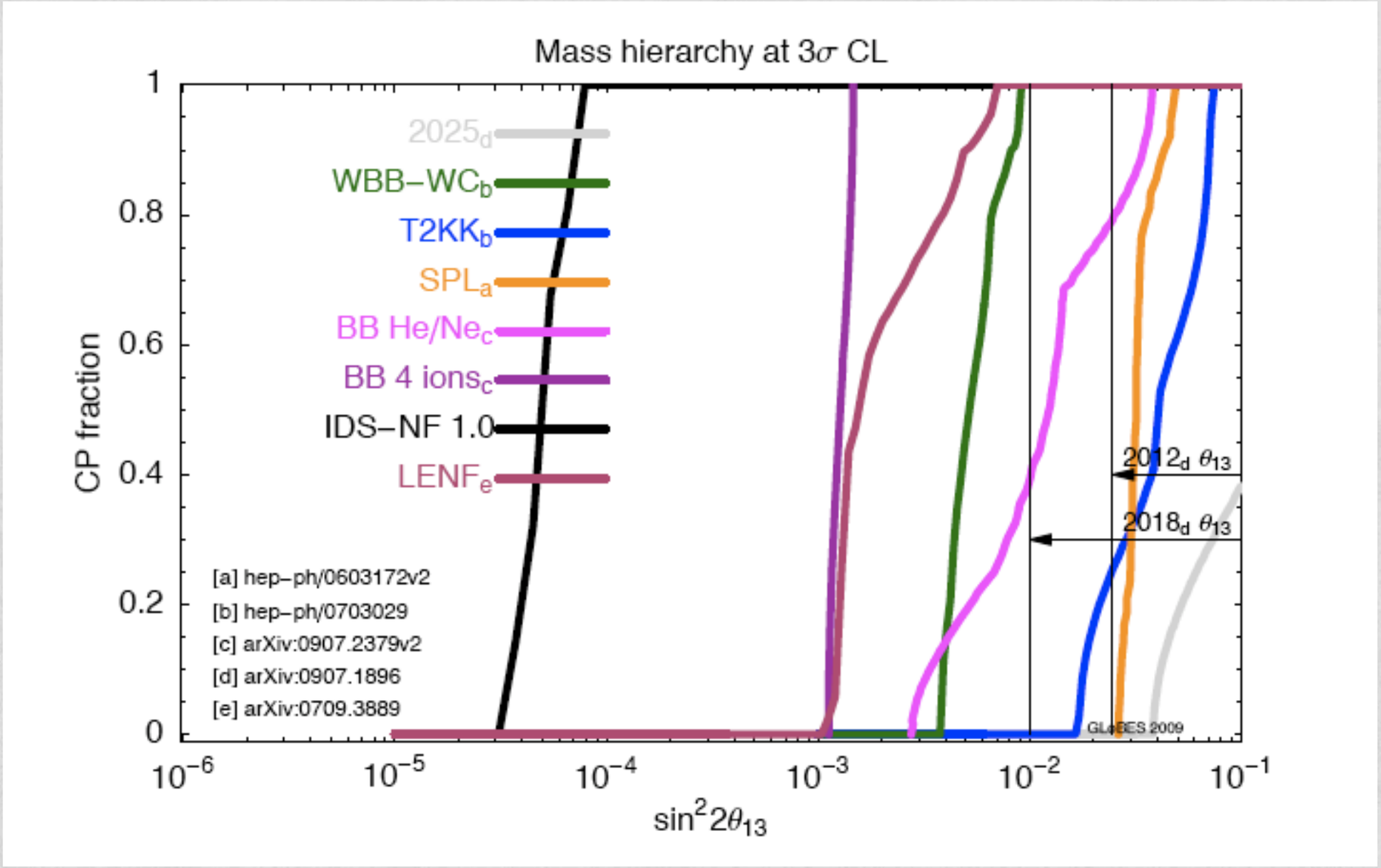
MASS HIERARCHY



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OVERALL WP6 ACTIVITIES

During the second EUROnu year, WP6 members have submitted 15 papers
(first year: 10 papers)

We are currently starting the preparation of the
2010 EUROnu WP6 Yearly Report

IAP COMMENTS

WP5+WP6 (cont'd)

last year's recommendation on WG1+6: WP6 should be integrated with the other WPs to aid in establishing performance goals.

as commented already, this is improving

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Good progress in simulating Water Cherenkov. For the study of performance on NC ^{0} rejection, we suggest involving somebody with Super-Kamiokande experience

we note excellent progress in simulating the Magnetized Iron Neutrino Detector and the improvement seen in efficiencies down to lower energies

need to maintain momentum in this area.

WP5+6 appears small. If the intent of EUROν is to influence CERN management as the "voice of the community," a larger section of the neutrino community must be brought in, without diluting the current effort.

it is a challenge when the community is fragmented and focused on the individual projects

WP6 may need to focus better on issues critical for the final deliverables

more communications and task-sharing with LAGUNA would probably help, especially in the area of costing large detectors and discussions on the low-energy neutrino factory option

the discussed modification of GLoBES to accept migration matrix with systematics parameters is an excellent idea

IAP COMMENTS

WP5+WP6

maintain and boost interactions between WP6 and other WPs

a study on near-detector design and performance is urgent (late)

accelerate this area

additional effort to build wider community would pay great dividends and should be attempted