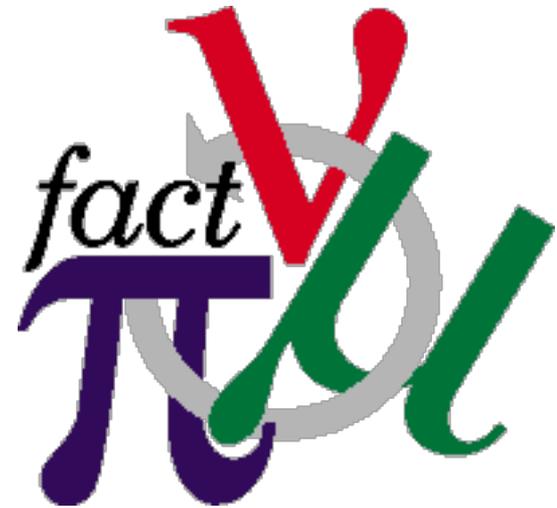


WG2 Introduction

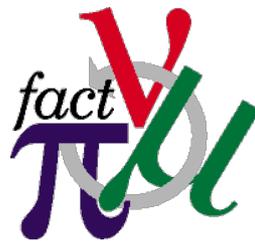


Luis Alvarez Ruso (IFIC)
Mike Kordosky (W&M)
Masashi Yokoyama (Tokyo)

July 24, 2012

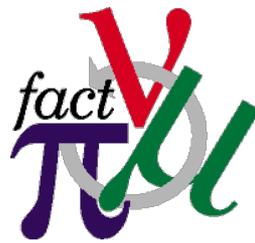
14th International Workshop
on Neutrino Factories, Super
Beams and Beta Beams
William & Mary / JLab
July 23-28, 2012

Questions from NuFact 2011



- 1) two nucleon mechanisms (NN) / meson exchange currents (MEC)
 - How do we get treatment of NN/MEC in MC codes used by T2K/Minerva/etc?
 - How do we distinguish, experimentally, between NN/MEC and FSI? Can ND280/Minerva/LAr see these events?
 - Clarify the effect on MiniBoone/MINOS/SK oscillation analyses.
- 2) List a set of cross-sections that can be carefully defined and measured by experiments and computed theoretically to reduce systematics for oscillation experiments.
- 3) How well can super-beams, beta beams and NuFacts know the flux? Is there a program of work that cuts across different experiments?
- 4) How should MC code improvements be prioritized? What specific changes should be made to common codes: GENIE/NEUT/NuWro, etc.
- 5) What program of measurements is needed to reduce the uncertainty in ν_τ CC cross-section?

Questions from NuFact 2010



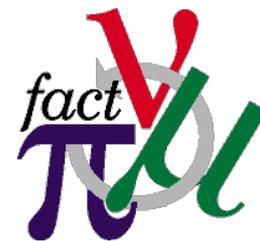
1) The puzzle of CC QE cross-sections and M_A

- “Recent” and “older” experiments disagree
- HE and LE experiments disagree
- “Bubble chamber” and other experiments disagree
- (some) experiments and theory disagree
- Or do they? → Significant progress

2) Precision cross-section measurements

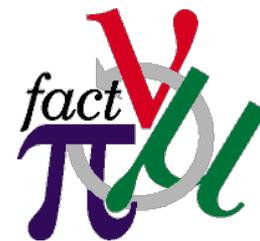
- How well can present beams & expts do?
- What could be done with a mini- ν factory (μ -SR)?

3) Near detector technology: can <my favorite technology> be used in a ND for a superbeam/NF/ β -beam?



Experimental Reports

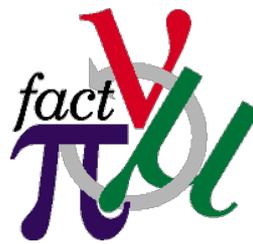
- T2K cross-section measurements
- MINERvA
 - ν_{μ} and $\bar{\nu}_{\mu}$ quasi-elastic cross-sections
 - Inclusive CC scattering off different nuclear targets
 - EM final states, pizeros, $\nu+e$ scattering, e vs γ ID
 - Charged pion production
- MiniBooNE updated results



Experimental Reports

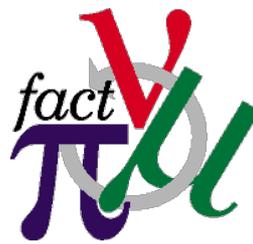
- Pion production from JLab Hall B
- Strangeness content of the nucleon from electron scattering
- πA cross sections: PIANO & HARPSICHORD

Theory / Phenomenology



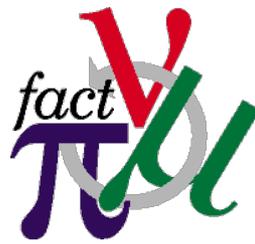
- Diffractive production of pions by neutrinos
- CC and NC pion production
- How to measure meson exchange currents
- Tuning NEUT to experimental data
- Report on GENIE development

Theory / Phenomenology



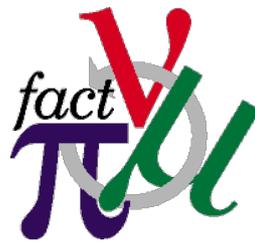
- Modeling QEL via relativistic Green's functions
- Model independent determination of QEL M_A
- ν_e vs ν_μ QEL scattering
- Parton distribution functions
- **Plenary talk: “Neutrino interactions with Nuclei”**

WG1+2: systematics & Θ_{13}



- Use of the ND: T2K
- Use of the ND: NOvA+MINOS
- Neutrino factory systematics
- LAGUNA study

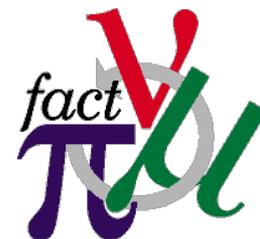
WG1+2: systematics & Θ_{13}



- Use of the ND: T2K
- Use of the ND: NOvA+MINOS
- Neutrino factory systematics
- LAGUNA study

Provocative Question

Can anyone envision a precision
 θ_{13} , δ , mass hierarchy experiment
without a ND?



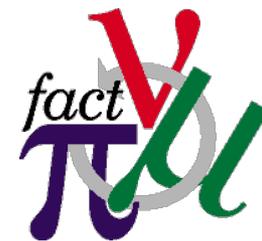
WG1+2+3: Flux

- NuMI and hadron production constraints
- Flux uncertainties at T2K
- Beta beam studies
- **Plenary talk:**
“The Low- ν Method for Flux Determination”

Busch Gardens Excursion

Sign up today

<http://tinyurl.com/d2plpqh>



Backups