

Previous lecture

- Kinematics, 4-momentum
 - ▶ details on handout
- neutrino properties
 - ▶ neutrino mass

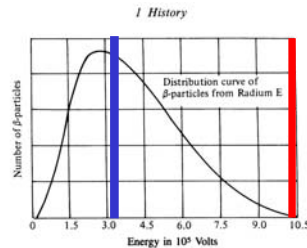


Fig. 1 Continuous beta spectrum of RaE.

ν mass references

Winter: pp. 9-11, 127-131
 Perkins (2nd Ed.): pp. 220-226
 Burcham + Jobs: pp 165-167

Lecture Content

- Approx. lecture content
 1. PP intro
 2. PP intro
 3. ν props 1: strong/e.m./weak, no. neutrino generations
 4. ν props 2: lepton no., ν existence
 - Examples of decay/production
 5. Neutrino mass
 - Fermi-Kurie plot
 - Phase space kinematics/4-momentum (handout)
 6. Parity and CP violation... (why so important in lepton sector?)
 - Wu et al., ⁶⁰Co experiment
 7. Detection & observation
 - Liquid, solid, bubble chamber
 - "Direct" methods (DONUT)
 8. Solar and atmospheric neutrinos
 - Puzzle: relative abundances \neq SSM prediction
 - Two-flavour neutrino oscillation formalism
 9. Neutrino oscillations and mixing
 - Possible solutions to solar/atm. ν problems
 10. Current and future experiments
 - SK, SNO, KamLAND, CHOOZ
 - MINOS, miniBOONE...
 - NDBD (NEMO, etc.)
 - JPARC, νF
 11. Implications for cosmology
 - Open vs. closed scenarios: various m_ν regions
 - ν as DM candidate?
 - Subject outlook (JPARC, MICE, Neutrino Factory, ...)

Today

- Neutrino mass, conference results \rightarrow web
- Kinematics - handout to lecture 5
- Parity symmetry
 - ▶ test of parity in weak decay

Halzen+Martin: p254
 Perkins (2nd Ed.): 6.4, 6.5
 Sutton: pp 44-50

Reminder: lecture questionnaire today - time at end of lecture.

Course homepage

Further Reading

Y2neutrinosWebLinks - General - TWiki - Mozilla Firefox

https://www.ep.ph.bham.ac.uk/twiki/bin/view/General/Y2neutrinosWebLinks

profile.pdf Publications Y2neutrinos WebConcept Y2neutrinos Products WebHome LCWS58 an PAC Review Haha - RL halita.pdf

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Welcome

This is a list of a few web pages which I have found more or less interesting, with my personal comments on them.

- [Particle Physics glossary](#)
- [Particle Physics acronyms](#) (see also [acronyms from FNAL](#))
- [Neutrino Unbound](#) - a pretty comprehensive collection of material
- [Particle Data Group \(PDG\)](#) - a definitive source. Includes:
 - [Summary Tables](#) - at a glance details of all major particles
 - [Reviews, Tables, Plots](#) - Some of these mini-reviews are very good and they cover a wide range of topics
 - [Full listings](#) - heavy going, but contains full details of measurements performed.
- [The Particle Adventure etc.](#) - possibly interesting, but level of text (and humour) a bit low
- [Particle Physics Education pages](#) - wide variety of levels, some useful background material here
- [The Durham HEP databases](#) - includes 'reaction data', allows you to download and study published experimental data yourself
- **Particle Physics "brieffbooks"** - Useful alphabetic description of many aspects of HEP
 - [Data Analysis](#)
 - [Particle Detectors](#)
- [arXiv.org](#) (UK mirror of Los Alamos preprint server. Very latest papers and conference proceedings usually appear here before publication, but note that articles are usually not yet peer reviewed so quality (though usually very good) not guaranteed.
- [HEP2003](#), European Physical Society High Energy Physics Conference, Aachen, Aug. 2003
- [Lepton-Photon03](#), Fermilab, Aug. 2003

-- Nigel Watson - 10 Nov 2008

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