

Previous lecture

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

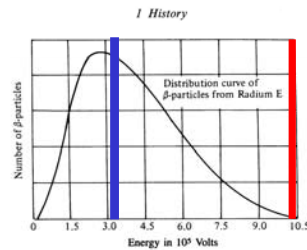


Fig. 1 Continuous beta spectrum of RaE.

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.
 - ▶ Feynman diagrams: strong/e.m./weak
 3. ν props 1: baryon and lepton numbers; no. neutrino generations
 4. ν props 2: ν existence
 - ▶ Examples of decay/production
 5. Neutrino mass
 - ▶ Fermi-Kurie plot
 - ▶ Phase space kinematics/4-momentum
 6. Parity and CP violation... (why so important in lepton sector?)
 - ▶ Wu et al., ^{60}Co experiment
 7. Detection & observation
 - ▶ Liquid, solid, bubble chamber
 - ▶ "Direct" methods (DONUT)
 8. Solar and atmospheric neutrinos
 - ▶ Puzzle: relative abundances! 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, $\nu\bar{\nu}$
 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 → 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

Summary of lecture questionnaire results

Course homepage



Free format comments

- Questionnaire given out too early for good judgement on problems and reading list
- Notes on board too bullet point like
- More quantitative/numerical examples
- Are lecture notes on WebCT
- Graphs/data showed a little hard to understand
- Go a little slower/explain graphs in more detail
- Notes on board not self-conclusive, sometimes hard to follow
- Give more theoretical background to material
- Quark content of certain particles hard to determine
- Print out of slides very small so hard to read