

FYS4555 - Compulsory assignment III

To be delivered 17.11.2018

1 The weak interaction

1. Calculate the π -decay rate in the case of $V - A$ theory (see section 11.6) using the trace formalism.
2. Compare $\pi \rightarrow e\nu/\pi \rightarrow \mu\nu$. Justify your answers.
3. Discuss Parity and Charge Conjugation violation.
4. Compare $\pi \rightarrow \mu\nu$ and $K \rightarrow \mu\nu$. Conclusions.
5. Explain how a limit on the mass of the muon neutrino is obtained. Base your answer on your own calculations and (possibly) referring to a publication on the subject.

2 The weak interactions of leptons

Solve problems 12.5 and 12.6 in the book.

3 Neutrinos and neutrino oscillations

Solve problems 13.7 and 13.8 in the book.