

ABSTRAK

Sardan K. Yallie. 2016. Grand Unified Theory SU (5) Higgs Boson. Skripsi, Program Studi S1 Pendidikan Fisika, Jurusan Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Gorontalo. Pembimbing I oleh Muhammad Yusuf, S.Si, M.Si dan Pembimbing II oleh Citron S. Payu, S.Pd, M.Pd.

Tujuan penelitian ini adalah untuk mengkaji Model Standar dan GUT berdasarkan teori berbasis simetri SU (5) melalui literatur-literatur sains yang relevan. Hasil dari penelitian ini adalah terdapat 24 boson gauge dalam model SU (5) diantaranya $G_r^s ; r, s = (1, 2, 3)$, W^\pm, W^0, B , $X = (1, 2, 3)$, $Y = (1, 2, 3)$, $\bar{X} = (1, 2, 3)$ dan $\bar{Y} = (1, 2, 3)$. Hal ini termasuk 12 boson gauge pada Model Standar yaitu $G_r^s = \left(G_1^1 - \frac{2B}{\sqrt{30}}, G_2^1, G_3^1, G_1^2, G_2^2 - \frac{2B}{\sqrt{30}}, G_3^2, G_1^3, G_2^3, G_3^3 - \frac{2B}{\sqrt{30}} \right)$ merupakan bidang gauge (gluon) dari SU (3) dan $w^\pm = \left(\frac{w^1 + w^2}{\sqrt{2}}, w^3, B \right)$ adalah SU (2) x U (1) yang mengukur boson. Sementara sisanya merupakan boson gauge baru yakni $X = (X_1, X_2, X_3)$, $Y = (Y_1, Y_2, Y_3)$ serta anti partikelnya $\bar{X} = (\bar{X}_1, \bar{X}_2, \bar{X}_3)$, $\bar{Y} = (\bar{Y}_1, \bar{Y}_2, \bar{Y}_3)$.

Kata Kunci: **Model Standar, GUT SU (5), Higgs Boson**

ABSTRACT

Sardan K. Yallie. 2016. The Grand Unified Theory SU (5) Higgs Boson.
Skripsi, Bachelor Study Program of Physics education, Department of
Physics, Faculty of Mathematics and Natural Science, State University of
Gorontalo. The Principal Supervisor is Muhammad Yusuf, S.Si, M.Si and the
Co-Supervisor is Citron S. Payu, S.Pd, M.Pd.

This research aimend at examining the Standard Model and GUT based on symmetry SU (5)-based theories through relevant scientific literatures. The research result showed there were 24 gauge boson on SU (5) model including G_r^s ; $r, s = (1, 2, 3)$, W^\pm, W^0, B , $X = (1, 2, 3)$, $Y = (1, 2, 3)$, $\bar{X} = (1, 2, 3)$ and $\bar{Y} = (1, 2, 3)$. It included 12 gauge boson on Standard Model in which $G_r^s = \left(G_1^1 - \frac{2B}{\sqrt{30}}, G_2^1, G_3^1, G_1^2, G_2^2 - \frac{2B}{\sqrt{30}}, G_3^2, G_1^3, G_2^3, G_3^3 - \frac{2B}{\sqrt{30}} \right)$ was the field of gauge (gluon) from SU (3) and $W^\pm = \left(\frac{W^1 + W^2}{\sqrt{2}}, W^3, B \right)$ was SU (2) x U (1) which measured boson. Meanwhile, the rest of new gauge boson was $X = (X_1, X_2, X_3)$, $Y = (Y_1, Y_2, Y_3)$ along with its antiparticles $\bar{X} = (\bar{X}_1, \bar{X}_2, \bar{X}_3)$, $\bar{Y} = (\bar{Y}_1, \bar{Y}_2, \bar{Y}_3)$.

Keywords: **Standard Model, GUT SU (5), Higgs Boson**

LEMBAR PERSETUJUAN PEMBIMBING

Skripsi yang berjudul

GRAND UNIFIED THEORY SU (5) HIGGS BOSON

Oleh

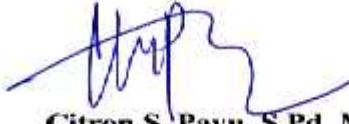
SARDAN K. YALLIE
NIM. 421 412 034

Telah diperiksa dan disetujui oleh

Pembimbing I,


Muhammad Yusuf, S.Si, M.Si
NIP. 19760311 199703 1 002

Pembimbing II,


Citron S. Pavu, S.Pd, M.Pd
NIP. 19740424 200501 1 004


Mengetahui
Ketua Jurusan Fisika,

Prof. Dr. H. Yoseph Paramata, M.Pd
NIP. 19610815 198602 1 001

LEMBAR PENGESAHAN

Skripsi yang berjudul : Grand Unified Theory SU (5) Higgs Boson

Oleh

SARDAN K. YALLIE

NIM. 421 412 034

Telah dipertahankan di depan dewan penguji

Hari/tanggal : Jum'at, 01 Juli 2016

Waktu : 09:00 WITA - Selesai

A. Penguji

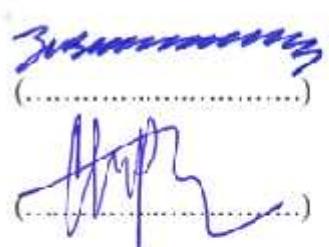
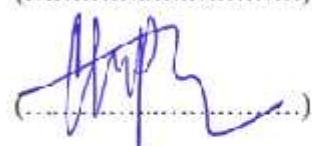
1. Prof. Dr. H. Mursalin, M.Si
NIP. 19570412 198602 1 003
2. Drs. Asri Arbie, M.Si
NIP. 19630417 199003 1 003
3. Tirtawaty Abdjul, S.Pd, M.Pd
NIP. 19790720 200501 2 002

(.....)

(.....)

B. Pembimbing

1. Muhammad Yusuf, S.Si, M.Si
NIP. 19760311 199703 1 002
2. Citron S. Payne, S.Pd, M.Pd
NIP. 19740424 200501 1 004


(.....)

(.....)

Gorontalo,

2016

DEKAN FAKULTAS MATEMATIKA DAN IPA
UNIVERSITAS NEGERI GORONTALO



Prof. Dr. Evi Hulukati, M.Pd

NIP. 19600530 198603 2 001