

MidTerm Review

LHCphenOnet Mid-Term Meeting

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Universität Zürich - Institute For Theoretical Physics

17-20 September 2012



My Background

- Home country: Italy
- Bachelor Degree in Physics at the University of Padua (9.2008)
Thesis: “Korteweg-de Vries Equation with a varying seabed”
Advisors: Prof. Giancarlo BENETTIN & Dr. Antonio PONNO
- Master Degree in Physics at the University of Padua (10.2010)
Thesis: “Study of the anomalous magnetic moment of the τ via its radiative leptonic decays”
Advisors: Dr. Massimo PASSERA & Prof. Simon EIDELMAN

Current Position

Ph.D. student. Joint doctorate (Co-tutelle de thèse) between



Department of Physics
University of Padova



Institute for Theoretical Physics
University of Zurich

Supervisors:

Dr. Massimo PASSERA & Prof. Dr. Thomas GEHRMANN
ESR at the University of Zurich (since January 2012).

Anomalous Magnetic Moment of Top Quark

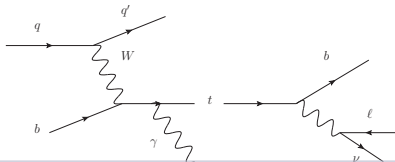
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$$\Gamma_{\mu}^{ttV} = ie \left\{ \gamma_{\mu} [F_{1V}^V(q^2) + \gamma_5 F_{1A}^V(q^2)] + \frac{\sigma_{\mu\nu}}{2m_t} q^{\nu} [iF_{2V}^V(q^2) + \gamma_5 F_{2A}^V(q^2)] \right\}$$

- Single-top+ γ as a tool to measure the $t\bar{t}\gamma$ coupling and to constrain the magnetic dipole form factor.
- Anomalous coupling implementation with *FeynRules*. Signal simulated at parton level through the matrix element event generator *MadGraph5*.

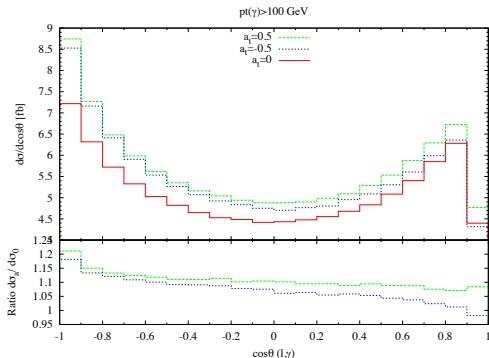


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Next Steps:

- Background effects.
- Estimate of the sensitivity bounds achievable at LHC@14TeV.

Training

Courses:

- Supersymmetry and supergravity.
- Cosmology.
- Advanced SM phenomenology and BSM.
- Advanced analytical calculus.

Schools, lectures and workshop:

- CAPP 2011 - Zeuthen (20-25 March 2011).
- Zurich Phenomenology Higgs Workshop (9-11 January 2012).
- LHCPHenoNet Winter School - Ascona (22-29 January 2012).
- Lecture Series: Statistical Tools in Collider Experiments, T. Junk & N. Chanon - Zurich (30 Jan - 10 Feb 2012).
- Mathematica Training and Couching, R. Mertig - Zurich (27-31 August 2012).

Training

Talks:

- LHCPHenoNet Annual Meeting - Durham - Lumley Castle (19-22 March 2012). *"A possible way to measure the τ anomalous magnetic moment"*
- Zurich PhD Seminar (29-30 August 2012). *"Probing top quark anomalous magnetic moment at LHC"*

Teaching activity:

- Spring Semester: assistant "Quantum field theory II"

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- The joint Ph.D. and the research activity in two different institute allowed me to be in touch with the main developments and open questions in different area of physics.
- Project on LHC physics and work on top-quark phenomenology have been an opportunity to improve my personal formation on collider physics and QCD.

Thanks!