

ESR 16



Stan Bentvelsen
on behalf of the FOM - node
April 3 - 2014



UNIVERSITEIT VAN AMSTERDAM



Radboud Universiteit Nijmegen

UCL
Université
catholique
de Louvain



ESR16 - Charged Higgs - *what*

- Contact
 - Eric Laenen, Fabio Maltoni, Wim Beenakker, Ronald Kleiss, Jos Vermaseren
- Objectives:
 - bring the accuracy of describing charged Higgs production in the two-Higgs Doublet Model to same level of accuracy as for Standard Model Higgs production (WP2).
- Secondments
 - Three months at ETH
 - Two months to in one of our private sector partners Maplesoft, Wolfram Research and Shell.
- Period:
 - start 2015 - start 2019 (4 years PhD period)

ESR16 Charged Higgs - *why*

- Search for extended Higgs sector
 - Highly accurate predictions
 - using aMC@NLO and resummation
 - Activity in WP2 connected to WP1
- Rich interaction with experimental group
 - both higher order and software including FORM
 - experimental research has large theoretical overlap
 - bridge between data analysis and interpretation
 - optimize search strategy - eg single top s-channel
- Funding beyond the 18 months
 - Not completely clear and under discussion
 - Need to be solved before advertisements can start

ESR 17



Stan Bentvelsen
on behalf of the FOM - node
April 3 - 2014



UNIVERSITEIT VAN AMSTERDAM



Radboud Universiteit Nijmegen

UCL
Université
catholique
de Louvain



ESR17 - ttbar Higgs production - *what*

- Contact
 - Stan Bentvelsen, Eric Laenen, Pamela Ferrari, Marcel Vreeswijk
- Objective (modified wrt 2013 proposal):
 - Focus on the ttH process
 - Simulation using MadGraph-aMC@NLO
 - Assess precise NLO corrections
 - feed back to event weight tools
 - Determine the Yukawa coupling of the top to the Higgs boson
 - WP2: predictions and simulations
- Secondment
 - Short visits to any of the partners.
 - Three months to CERN for close consultation on analysis
 - A secondment in one of our private sector partners Maplesoft, Wolfram Research and/or Shell.

ESR17 - ttbar Higgs production - *why*

- Analysis ambition
 - Isolation of top associated Higgs events at the LHC
 - Determine top-Higgs Yukawa coupling
- Road towards the measurement:
 - Validation of key Higgs background processes
 - data driven normalization and shape in background increased region
 - Evaluation of uncertainties
 - extrapolating to signal regions using simulations
 - assess systematics on signal
- Practical requirements
 - Short visits to any of the partners.
 - Three months to CERN for close consultation on analysis

ESR17 - ttbar Higgs production - *network*

- Activity in WP2 connected to WP1
 - Predictions and simulations of signal and background
 - Interpretation of the data
- Overlap experiment - theory
 - position includes responsibilities in ATLAS
 - authorship, (some) hardware and performance work
 - experimental research has large theoretical overlap
 - bridge between data analysis and interpretation
- Beyond the 18 months
 - Top-up position at Nikhef/FOM in ATLAS group
 - agreement for full 30 months
 - PhD defense at University of Amsterdam
 - Advertisement to start