Roberta Arcidiacono

BIO AND EDUCATION

Roberta Arcidiacono is pursuing the understanding of the fundamental building blocks of nature and how they interact, working in the field of High Energy Particle Physics.

From 1995 to 2003 she has been active in the fixed target experiments NA48-NA48/1-NA48/2 (CERN), investigating what is behind the observed asymmetry between matter and antimatter in the universe. Since 2003 she works in the CMS (Compact Muon Solenoid) experiment at CERN, which has crossed a new threshold in collision energy, opening a new window on particle physics.

She worked on the development and realization of data acquisition and trigger systems, on the commissioning and calibration of calorimetric detectors for high energy physics experiments, on data analysis for the determination of precision parameters in the neutral Kaon system, on measurements of diffractive cross sections and soft-QCD processes in pp collisions at high energy.

In 2014 she has started to work on silicon detectors development/studies within the RD50 project (CERN Silicon Detector Development), and now is part of the Advanced ERC winning Team "Ultra-Fast Silicon Detectors: Enabling Discoveries", ERC-2014-ADG panel.

1999 Ph.D. in Physics, Università di Torino, Thesis: “Systematic effects on ε’/ε in the NA48 experiment at CERN: trigger efficiency and accidentals correction” Tutor: Prof. Ezio Menichetti

1995 Master Degree in Physics, Università di Torino, *cum laude*. Tutor: Prof. Ezio Menichetti

1989 Maturità Scientifica, Liceo Scientifico ``G.Galilei'' Ciriè (TO), score 60/60.

UNIVERSITY CAREER

2010	Researcher Università del Piemonte Orientale
2006-2010	Contract Professor “Rientro dei Cervelli”, Università di Torino
2003-2006	Research Scientist, MIT, Boston
2001-2003	Research Fellow, CERN, Ginevra
1999-2000	Post-Doc, Università di Torino
1999	Graduate Grant “Angelo della Riccia”, CERN, Ginevra

SCIENTIFIC POSITIONS

2014/2015	Scientific Associate, CERN, Geneva (CH)
1995-2000 2006-ora	Associate to “Istituto Nazionale di Fisica Nucleare”

MAIN FIELDS OF INTEREST

1. Kaon physics, CP-violation
2. Electromagnetic calorimeter
3. Trigger system
4. Diffractive Physics
5. Silicon detectors with gain

CURRENT ISSUES OF RESEARCH

1. Within CMS – general purpose experiment at the Large Hadron Collider that aim to study the nature of interactions between fundamental particles.

R. Arcidiacono is co-convener of the CMS Trigger Performance Group: the group coordinated the trigger performances studies, the validation and monitoring activities of the High Level Trigger triggers, and provides estimates for the overall High Level Trigger menu behavior.
She also works in CT-PPS: project which aims to build a forward detector to study events with scattered protons. She works in the tracking system.

2. Within NA62 – fixed target experiment at CERN- SPS
The experiment propose to measure the very rare kaon decay K^{+}-> pi^{+} nu nubar to extract a 10% measurement of the CKM parameter $|V_{td}|$. R. Arcidiacono is involved in the construction and commissioning of the GigaTracker detector.

3. R&D on fast timing with silicon detectors.

The final goal of the R&D project called UFSD (Ultra Fast Silicon Detector) is to develop a finely segmented silicon sensor able to reach resolutions of ~10 picoseconds and ~ 20-30 microns. This project is receiving support from INFN gruppo V, RD50 Collaboration at CERN and the italian Ministero degli Affari Esteri (MAE). The project is supported by an ERC advanced grant since September 2015.

TOP FIVE PAPERS

1. R. Arcidiacono et al, (2015). Design optimization of ultra-fast silicon detectors. NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH. SECTION A, ACCELERATORS, SPECTROMETERS, DETECTORS AND ASSOCIATED EQUIPMENT, vol. 796, p. 141-148, ISSN: 0168-9002, doi: 10.1016/j.nima.2015.04.025
2. R. Arcidiacono et al. , CMS Collaboration (2013) . Measurement of the inelastic proton-proton cross section at root s=7 TeV. PHYSICS LETTERS. SECTION B, vol. 722, p. 5-27, ISSN: 0370-2693, doi: 10.1016/j.physletb.2013.03.024
3. R. Arcidiacono et al. , CMS Collaboration (2012). Search for the standard model Higgs boson decaying into two photons in pp collisions at root s=7 TeV. PHYSICS LETTERS. SECTION B, vol. 710, p. 403-425, ISSN: 0370-2693, doi: 10.1016/j.physletb.2012.03.003
4. R. Arcidiacono et al, NA48 Collaboration (2001). A precise measurement of the direct CP violation parameter Re(epsilon '/epsilon) RID A-4071-2012. THE EUROPEAN PHYSICAL JOURNAL. C, PARTICLES AND FIELDS, vol. 22, p. 231-254, ISSN: 1434-6044, doi: 10.1007/s100520100822
5. Arcidiacono R et al (2000). The Trigger Supervisor of the NA48 experiment at CERN SPS. NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH. SECTION A, ACCELERATORS, SPECTROMETERS, DETECTORS AND ASSOCIATED EQUIPMENT, vol. 443, p. 20-26, ISSN: 0168-9002, doi: 10.1016/S0168-9002(99)01018-9