MARCOS ROMERO LAMAS

Physicist

WHO AM I?

I am currently working in the analysis of LHCb data to measureme the weak ϕ_s phase, testing the Standard Model to its limits. This analysis requires a proper selection of the events (which we do using different ML algorithms) and the estimation of different corrections needed to determine the most precise value of ϕ_s to date. I use python as an interface to cuda-C/openCL kernels thus enabling python to use the HPC capabilities of GPUs. This is the core of my PhD thesis, which I expect to finish by the end of 2021.

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marcos-romero-lamas

EXPERIENCE

Oct. 18 – *present* — **Research Assistant** — **Instituto Galego de Física de Altas Enerxías (IGFAE)**

- Analysis of $B_s^0 \to J/\psi K^+ K^-$ samples to determine the world's best measurement of ϕ_s oscillation phase of B_s^0 neutral meson.
- Monte Carlo liaison of Charmonia working group simulations. *May 2019 – (May 2021)*

Jan. 17 – Jul. 17, part time — **Research Assistant** — **Instituto Galego de Física de Altas Enerxías (IGFAE)**

- Study of $\mathcal{T}$–odd asymmetries (time reversal) in the $B_s^0 \to K^+\pi^- K^-\pi^+$ decay through the spin resonance of 1 $K^{*0}(892)$.

EDUCATION

Oct. 18 – *present* — **PhD in Nuclear and Particle Physics** — **Universidade de Santiago de Compostela (USC)**

Sep. 17 – Jul. 19 — **MSc in Industrial Mathematics** — **Universidad Politécnica de Madrid (UPM)**
Modelling Specialization: Finite Elements, Stochastic Calculus, Finances Modeling, Multidisciplinar Design Optimization, Numerical Methods, Modelling in Biomedicine, Perturbation Theory...
Dissertation: *GPU–based time–dependent angular analysis of $B_s^0 \to J/\psi K^+ K^-$ decay and systematic uncertainty validation.*

Sep.13 – Jul. 17 — **Bachelor of Science in Physics** — **Universidade de Santiago de Compostela (USC)**
High Energy Physics Specialization: QFT, Complex Analysis, Algebra, Differential Geometry, Partial Derivatives Equations, Classical and Continuum mediums Mecanics, Solid State, Electronics...
Dissertation: *Study of T–odd observables: B_s^0–meson decay in two neutral vectorial mesons.*

COMPLEMENTARY EDUCATION

October 2020, *virtual* — **Programming and environments for parallelism** — **CERN openlab**

June 2020, Santiago de Compostela — **Neural Networks: Applications to High Energy Physics and Industry** — **USC**

January 2020, Santiago de Compostela — **Introduction to Quantum Computing** — **USC**

October 2019, Barcelona — **1st COMCHA School** — **Universitat Ramon–Llul**

- Lectures on Artificial Intelligence and Machine Learning
- NVIDIA Deep Learning Institute Certificate: Fundamentals of Accelerated Computing with CUDA C/C++

Jul. 18 – Aug. 18, Genève — **CERN Summer School** — **Conseil Européen pour la Recherche Nucléaire**

- Analysis of LHCb data to make precision measurements on K^+ mass.

TALKS AT CONFERENCES

In addition to many talks given at B2CC and LHCb Simulation working groups weekly meetings, I gave talks at some national and international conferences.

October 2020 *virtual* — **Acceptances and resolutions in $B_s^0 \to J/\psi\phi$** — **Analysis and Software week**

October 2019 Oviedo — **Latest LHCb results on ϕ_s** — **CPAN XI days**

September 2019 Perugia — **CP violation in beauty and charm at LHCb** — **KAON 2019**

OUTREACH

March 2021 *virtual* — **CMS Masterclass 2021** — **USC in collaboration with CERN**
Speaker and instructor during the laboratory sessions as well as organiser of the event.

March 2020 Santiago de Compostela — **CMS Masterclass 2020** — **USC in collaboration with CERN**
Speaker and instructor during the laboratory sessions as well as organiser of the event.

July 2019 Santiago de Compostela — **Summer Scientific Campus** — **USC in collaboration with the Spanish Government**
Speaker and instructor during the laboratory sessions.

April 2019 Santiago de Compostela — **CMS Masterclass 2019** — **USC in collaboration with CERN**
Speaker and instructor during the laboratory sessions.

PUBLICATIONS

May 19 - *present* Genève — **LHCb publications** — **Inspire / CERN Document Server**
To date, April 24, 2021, I have participated in 55 scientific papers, where having a main role in:
- **Updated measurement of time-dependent CP-violating observables in $B_s^0 \to J/\phi K^+K^-$ decays**, arXiv:1906.08356v4

December 2020 Santiago de Compostela — **Fast simulation of a forward detector at 50 and 100 TeV proton-proton colliders**
V. Chobanova, D. Martínez Santos, C. Prouve, M. Romero Lamas
We evaluate the performance of an LHCb-like detector using a fast simulation of proton-proton collisions at center-of-mass energies of 50 and 100 TeV. (...)

April 2020 Santiago de Compostela — **CP violation in beauty and charm at LHCb**
M. Romero Lamas
The most recent results on CP violation in the decay, mixing and interference of both b and c hadrons obtained by the LHCb Collaboration with Run I and years 2015-2016 of Run II are presented. (...)

LANGUAGES

Hereinafter R is understood by reading, W by writing and S by oral communication.

Spanish Native

English R(excellent) · W(excellent) · S(very good)

Portuguese R(good) · W (basic) · S (basic)

Galician Native

IT SKILLS

I am a unix-like systems user, who loves Vim to edit code and avoids using the mouse

Programming languages Python (excellent), CUDA-C (very good), OpenCL (very good), C (good), C++ (good), Fortran 90 (basic)

Statistical analysis tools ROOT, RooFit, Hydra

Subject–Specific Matlab (excellent), Mathematica (excellent), Origin, LabView, COMSOL

Markup languages LaTeX (excellent)