

Thanks!

Remember not only to say the right thing in the right place, but far more difficult still, to leave unsaid the wrong thing at the tempting moment.

Benjamin Franklin

It is **thanks** to many people that all my work during all these years could finally come to a meaningful conclusion. I hope I can say the right thing about all of them in this place.

Chronologically I have to first acknowledge the “push” by Teresa Peña, who, in the year 2000, saw the experimentalist in me and encouraged me to contact João Seixas regarding some experimental activity at CERN. After discussing with João, my trial assignment at CERN in November 2000, was to write C++ code for the `na60root` software simulation package. Although I managed, I was not very happy and Carlos Lourenço, spokesperson of NA60 at the time, detected my engineering skills, valuable in an experiment being put together. Eventually I enrolled in a doctoral programme aimed at producing data samples and studying them with João and Carlos as my supervisors.

After coming back to CERN in early 2001, where I stayed ever since, I worked full-time for one year in the CERN electronics design group on PCI readout hardware and developed several Linux drivers for it. In this context I wish to thank Angel Guirão and Hans Muller for their helpfulness and warm welcome into their group.

Also in 2001, it became clear that silicon pixels would not be available for the 2002 proton run. This led to a rushed effort in building a silicon microstrip detector that would provide the first NA60 results in proton-nucleus collisions. I was heavily involved in putting together the electronics for this detector. In this context, I smile at the long hours spent with Andrea Boccardi and Jan Buytaert debugging all the problems out of the electronics. The help and team spirit of Hermine Wöhri, Carlos Lourenço, and Pedro “Frodo” Ramallete in this project are also acknowledged. I also wish to mention the wonderful set of unofficial summer students from IST, who did anything and everything needed, from cables to software: Ana Silva, Manuel Silva, Luis Figueira, Artur Palha, Iara Pereira, Ricardo Fradinho and Pedro Martins. Without them NA60 would have missed the 2002 proton run.

Once pixel detectors became available, I was given the task to distribute them inside the vertex dipole field, with the help of Ruben Shahoyan and Ernst Radermacher.

To read out the pixel detector, a new generation of compact and flexible PCI cards was developed. I was at the centre of this effort, done in close collaboration with Michele Floris and Gianluca Usai, whose FPGA registers were not always `0xdeadbeef`. At the end, the CFD was a much better card than any other done before and I now enjoy the thought of all the frustrating hours spent in front of the oscilloscope.

In the building and operation of the pixel tracker, I acknowledge the positive environment of the NA60 Pixel Group: Markus Keil, Károly Banicz, Gianluca Usai, Michele Floris, Hiroaki Ohnishi, Johann Heuser, Ruben Shahoyan, Carlos Lourenço and Ernst Radermacher.

During the data-taking in 2003 and 2004, the counting room was the operational headquarters for the harvest of ripe dimuons. Many NA60 collaborators took shifts during the runs and are to be acknowledged for their effort in keeping it going. I wish to express my thanks to Peter Rosinsky and Pedro Martins, responsables for the DAQ system, and who were always willing to understand the new data format coming out of the device drivers I wrote, Eirik Tveiten and Nicolas Guettet, responsables for the DCS system, relentless in keeping the LV and HV power supplies working and providing new measurements of the environmental conditions of the detectors, Pedro Parracho and Andreas Förster, who took over the operations of the strip detectors during the 2004 run and Lau Gatignon and Peter Sonderegger, the knowledgeable experts in what concerned the NA60 beam and

beamline. It is also with great joy that I recall the many days (and nights) spent in front of “The Matrix” in the company of Louis Kluberg and Paul Force, tuning the trigger system prior to (and during) the runs. There, I showed the wonders of digital oscilloscopes while learning all about the entrails of a dimuon trigger as old as myself.

During late 2004 and throughout 2005, the emphasis went into data analysis. The mysteries surrounding charm meson production would not have been as clear without the insight from Carlos Lourenço, Hermine Wöhri, Michelangelo Mangano and Torbjörn Sjöstrand. The background subtraction scheme of NA60, immensely more involved than that of NA50 or NA38 is a *tour de force* by our offline software and physics analysis wizard: Ruben Shahoyan. Without his preserverance, the final correctly matched signal would never had seen daylight.

All in all, these five years have been an overwhelming learning experience. In that sense I wish to acknowledge all of NA60 colleagues with whom I kept close contact, especially those in the Torino and Cagliari groups.

Special final mentions are due to Carlos Lourenço, who always kept an overview of my work while letting me spread my focus, and who always had an open door (or rather e-mail window) for my problems, and to João Seixas, whose support and encouragement, even at a distance, is a time invariant. They are among all those who touched my life at a personal level, especially in the harder times. There are more out there, and they know who they are.

Then my family: a mix of people who always encouraged me to do whatever I wanted as long as I am happy with, and am able to excel at it. Even if some of them tell their friends that I am a “muon engineer”, I know they care for me very much, since they keep tying up loose ends I have back in Portugal.

Also in Portugal I had many friends that kept on being so, despite the space-distance and small time-windows available for personal contact: Cláudio, Hugo and João, Raquel, Ricardo, etc.

Finally, *Life, the Universe and Everything*.

Thank you all,

Obrigado, Grazie, Merci, Շնորհակալություն, Danke, Köszönöm, Bedankt, ありがとうございます, Ďakujem, Gracias,

André David

Genève, February 23, 2006.

This work was partly supported by the Portuguese Fundação para a Ciência e Tecnologia under Grant SFRH/BD/4761/2001 and by the CERN Doctoral Student Programme.