Curriculum Vitae

Personal data:

Name	Stefan (Mikael Greger) Ask
Born	Hammarby, 15:e December 1976
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Education:

- Engineering and Natural Science Program at Tycho Brahe high-school in Helsingborg (Electronics as main field).
- Military service as a Telecommunication Engineer (12 months).
- Summer Student Program at CERN, Geneva (3 months). (`http://www.cern.ch`)
- Master of Science in Engineering Physics at Luleå University of Technology. (Civ. Ing. Teknisk Fysik, individual courses can be found at `http://www.hep.lu.se/staff/ask/studforte.html`)
- Graduate studies and research. (Planed Ph.D. thesis defense the 12^{th} of November 2004. Further details regarding my research can be found at `http://www.hep.lu.se/staff/ask/reports.html`)

Career:

95.07-95.08	Worked as an engineer with installation and service of radar-simulators at the Airtrafficservice-Academy in Malmö.
95.09-00.06	Undergraduate studies in Engineering Physics at Luleå University of Technology. Master of science degree.
(97.06-98.06)	Military service as a Telecommunication Engineer in the Swedish Army.
(99.06-99.09)	Summer Student at CERN.
00.06-01.04	Scholarship at the department of High Energy Physics at Lund University.
01.04-Now	Ph.D. student at the department of High Energy Physics at Lund University.
(00.06-03.02)	Stationed at CERN in Geneva.
(04.02)	Thesis defense for Philosophy Licentiate. (`http://www.hep.lu.se/staff/ask/doc/lic_final.ps.gz`)

Experience and qualifications:

The Single Photon Analysis at DELPHI

I am a member of the single photon analysis group in DELPHI. Within this group I have been mainly working with the final event selection used in the searches for new physics together with the interpretation of the results within the corresponding theoretical models. This analysis was based on events with only one photon detected by one of the electromagnetic calorimeters in DELPHI together with no other significant activity registered in the experiment. Due to the missing energy in the single photon events this topology is very well suited for searches for new physics where new weakly interacting particles are predicted. I have made searches for both *supersymmetry* (SUSY) and *large extra dimensions* as well as for *non-standard neutrino interactions* and more *model independent scenarios*. In the final selection I used a likelihood ratio method in order to maximize the sensitivity to the different possible signals from new physics. Since no signal was observed in any of the searches the results were used to exclude the corresponding theoretical models where a Bayesian multi-channel approach was adopted for the limit computations.

The Chargino Search at DELPHI

I was also a member of the DELPHI chargino search team where I was mainly working with the pre- and final event selection and the computation of the related systematic errors of the number of selected events in the simulations. Chargino production was one of the most probable discovery channels for *supersymmetry* at LEP and this search was therefore very important in the search for supersymmetery. Due to the very complex chargino signal, four different event topologies were analyzed (including both purely leptonic and hadronic events) by a likelihood ratio method using a big verity of discriminating variables. No chargino signal was observed in this analysis and the results were used to exclude the theoretical parameter space, where the DELPHI limits gives some of the most stringent constraints on SUSY today. It was on this work my Licentiate Thesis, *"Optimized event selection within the chargino analysis at the DELPHI experiment"*, was based (`http://www.hep.lu.se/staff/ask/doc/lic_final.ps.gz`).

The LEP SUSY Working Group

During my time as a Ph.D. student I was choosen to be one of the two DELPHI members of the LEP SUSY working group where I am responsible for the combination of the SUSY searches using single and acoplanar photon events from the four LEP experiments. Since there was no observed signal in any of the search channels studied by the SUSY working group, a common combination procedure to produce exclusion limits was used, which corresponds to a Frequenstist multi-channel approach called the CL_s method (or the likelihood ratio method). These combined photon results are the strongest limits of its kind and were used to exclude the SUSY parameter space, mainly in the so called GMSB scenario.

The LEP Exotica Working Group

After the combinations of single photon results within the SUSY working group a combination of searches for large extra dimensions was initiated, which was released by the LEP Exotica working group. This combination made by me was made using a Bayesian approach similar to the methods used by the individual analysis at the four LEP experiments. This combination provided the most stringent constraints today on the fundamental scale of gravity from accelerator based searches for large extra dimensions.

Work with the DELPHI Detector

During the last summer when DELPHI was running and later during the extended time of running, due to the hints of a Higgs signal, I was working mainly with the running of the DELPHI experiment. During this period I was working expert shifts for the DELPHI luminosity detector STIC including daily performance checks and on call availability in case of detector incidents. In addition to this I was regularly working shifts with online data quality checking of the overall DELPHI experiments, involving all the sub-detector systems.

Off-Energy Electron Background Studies

I was, as a Master Thesis student, involved in studies of the background from off-energy electrons in the DELPHI calorimeters. This kind of background, which is produced by electrons scattered by residual gas molecules in the beam pipe, was studied for all the DELPHI calorimeters using a random trigger with no correlation to the beam crossings. In addition to this I made a study of the veto counter performance (this scintillator detector was located in front of the STIC detector and was used for electron-photon identification). My Master Thesis *"Calorimeter analysis in the DELPHI experiment"* was based on these studies (`http://www.hep.lu.se/staff/ask/doc/StefanAsk_Exjobb.ps.gz`).

The CALEIDO Project

I was at two different occasions participating in a testbeam experiment called CALEIDO. CALEIDO was a prototype of an electromagnetic calorimeter based on the shashlik technique with longitudinal segmentation and read-out. The testbeam runs were performed, mainly by the people from the STIC group, at both the north- and west-areas at CERN and I participated in both the setup and the data taking.

The Student Muon Detector

At Lund University I have been involved in the maintenance and upgrade of a scintillation counter detector used in the undergraduate education. This detector is used for measurements of the muon lifetime and verification of the parity violation in muon decay. Due to the very old trigger and readout electronics used, an upgrade is in progress where I have been designing the trigger logic which is implemented in a integrated circuit, a so called CPLD.

Presentations

- I have made three presentations on behalf of the four LEP collaborations at international particle physics conferences:
  – "Extra Dimension Search at LEP", 32^{nd} International Conference on High Energy Physics (ICHEP04), Beijing, China, 16/8-2004.
  – "A Review of the SUperSYmmetry Searches at LEP", $\mathrm{XXXVIII}^{th}$ Recontre de Moriond, Les Arcs, France, 15/3-2003.
  – "GMSB search at LEP", DPF2002, Williamsburg, VA US, 27/05-2002.
- One presentation of my research results at a collaboration meeting in Delphi, Greece.
- Eight presentations of my research results to the DELPHI collaboration at CERN, Switzerland.
- Two presentations of my research results at Lund University, Sweden.

Programming Skills

Experience of programming C (C++) and Fortran 77.
Some experience of programming Assembly (Motorola 68K) and VHDL using Mentor Graphics / ModelSim and Symphony EDA Sonata.

Teaching Experience

- Responsible for exercise sessions in an undergraduate course in particle physics (fourth year students).
- Responsible for a muon laboration where the muon lifetime was measured and the parity violation in the muon decay was verified (third year students).

Languages

Swedish, mother tongue.
English, very good.