

## 日本の研究活動と暮らしについて思うこと

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### Impressions of Research Activities and Life in Japan

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#### Abstract

I arrived in Japan on the first of April 2005 as JSPS fellow, just after graduating at the rf group of the Paul Scherrer Institute (PSI) in Switzerland. I'm now working in the accelerator development group at RIKEN Nishina Center in Wako-shi. Research and life in Japan is very exciting and in some points different from those in Switzerland.

#### 1. The Start of a New Adventure

At the end of my graduate studies, my boss suddenly asked me if I was interested in going to RIKEN as a post-doctoral researcher. Since RIKEN is currently building the most advanced cyclotrons and my PhD thesis was about beam-cavity interactions in cyclotrons, it would certainly be very interesting to work at RIKEN. On the other hand, I didn't know much about Japan and many people actually advised me against going to Japan. Their concern was mainly about the cultural differences and difficulties to find a job later in Japan, Europe or in the USA. Nevertheless, we applied then for a two year post-doctoral fellowship of the Japanese Society for the Promotion of Science (JSPS) and luckily got it approved at the end of the year 2004.

Then, soon after a farewell party with a lot of self-made sushis, I had to embark the aircraft and finally arrived in Japan after a flight of about twelve hours. On the way from Narita airport to RIKEN in Wako-shi, I had to change the train at Ikebukuro and suddenly faced the first challenge: How to get the metro ticket? I pushed almost all buttons of the vending machine, but nothing happened! But soon, a Japanese told me that I would have to insert the money first and push the corresponding button later. Well, it certainly was not be the last surprise!

#### 2. Impressions about Research Activities in Japan

Japan and Switzerland are both knowledge-based nations and large sections of their respective economies are science and technology driven. Both countries allocate a significant part of their revenues to sustain a high level of research and development and get close to 70% of the total amount of R&D supported by the private sector.

However, I had the impression that collaboration between research institutes and industry is much closer in Japan than in Switzerland. I was surprised that there is no workshop at RIKEN and that the groups are typically much smaller than at PSI. Here at RIKEN, a lot of work is done by the industry partner, or the industry even lends engineers and technicians to the research institute. As already mentioned by several foreign researchers in previous issues of this journal, Japanese research seems to make extensive use of subcontractors. I think that this yields a better technology transfer between industry and research institutes, but on the other hand might increase the dependency of the research institute on industry and makes emergency repairs slower and more difficult.

Also the education system seems to be slightly different. In Switzerland, students can access every university after getting the college degree but relative-

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ly many students drop out during their studies. On the other hand, there is a big competition in Japan to get admission for prestigious universities, but there seems to be almost no selection process later to get the final degree. Another difference is that the graduate students in Switzerland usually get a salary which allows them already to live financially independent from their parents.

At RIKEN, I was very impressed about the size of the institute, its infrastructure and the cheap price of the lunch and dinner at the canteen, which typically costs about the same as a cup of coffee at Tully's or less than one third I used to pay at PSI. RIKEN in Wako-shi seems to be about the double size of PSI and builds currently the most advanced and modern cyclotrons. In contrast, the ring-cyclotron at PSI is already more than 30 years old. The PSI cyclotrons were continuously upgraded and optimised for the most intense proton beam of more than 1 MW.

RIKEN's cyclotrons, on the other hand, are operated at lower beam current, but can accelerate a large variety of ion beams and therefore have variable-frequency rf-systems. This makes the design of rf-structures more challenging and gives me the opportunity to learn many new things about the design of a new variable-frequency flattop cavity, the design of which is the theme of my work as a JSPS post-doctoral researcher, and about beam dynamics for the RIKEN Ring Cyclotron (RRC). Flattop cavities are commonly used in cyclotrons to add a third or fifth harmonic to the accelerating voltage. The resulting broader acceleration voltage reduces the energy spread of the particle bunches and hence the extraction losses and might therefore help to increase the beam intensity of the future RIKEN Accelerator Research Facility.

There were also some minor changes from my previous working environment at PSI: The probably most significant difference is that I had to participate at the stand-by for emergency duties for the rf-systems at PSI, and I don't at RIKEN. This makes it easier here to focus on my research project and I really enjoy the weekends and evenings without fear of emergency calls. On the other hand, I was impressed that the RRC has almost no scheduled service days and only very short shutdown periods. This is nice for the users, but makes it difficult to plan major upgrades - like in fu-

ture the insertion of a new flattop cavity into the valley box of the RRC for example. At PSI, we typically had a shutdown period from the end of December until March and even a service day every second week for this purpose.

### 3. General Impressions about Life in Japan

The first impression about Tokyo was that it is very crowded and noisy but has an amazing infrastructure. On a surface of about twenty times smaller than Switzerland, there live about two times more people in Tokyo than the about seven million habitants in Switzerland. Despite that it's very noisy and that they all are in a hurry, everything is usually very peaceful. The noise actually seems to be no problem for Japanese, or they already got used to it and they manage to fall asleep even when they are standing in the trains - amazing! Since there are only few foreigners living in Japan (compared to about 20% foreigners in Switzerland), I felt sometimes a little bit exposed.

I was a little bit shocked when I saw the housing prices for the first time which seem to be amongst the highest of the world. For about the same rent of my 2LDK apartment in Switzerland, I got only a small studio apartment in Wako-shi.

Another remarkable observation was that Japanese mostly wear suits with neckties, and sometimes, when I'm wearing my comfortable "jimbei", I'm wondering why most Japanese men prefer to wear western-style clothes instead of traditional Japanese clothes.

Fortunately, I also had some time to travel around Japan and keep wonderful memories. The trip to Shirakami-sanchi for example was very impressive with volcanic active lakes, rivers and we even took a bath in a "roten-furo" in an unforgettable ambiance. I became also a big fan of the delicious and healthy Japanese food with really fresh fish, and I must confess that I'm actually eating "natto" regularly at the canteen - to the surprise of many Japanese.

### 4. Conclusions and Acknowledgments

I really enjoy it here in Japan and I can only recommend other researchers to spend some time in Japan. Also, I'm very grateful that I had the chance to meet my wonderful fiancée here in Japan. This certainly also helped a lot to get an easier access to the Japanese

culture.

Recently, PSI made an interesting job offer for the time after the JSPS-fellowship. Therefore, we plan to move back to Switzerland in spring 2007, but I hope, that we can keep good contact with coworkers and friends in Japan and collaborate with RIKEN nevertheless. I think that in general, the quality of life is currently slightly higher in Switzerland. But especially research and development is very exciting in Japan and many Swiss companies and research institutes could learn a lot from the vitality, productivity and willingness for venture and innovation of their Japanese counterparts!

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