

Summary of the CLIC meeting from 12.11.2010

The meeting started as usual with the news from the CLIC management. Jean-Pierre Delahaye talked about the large request for fellows by the CLIC project. In addition he talked about the successful linear collider school organized by Herman Schmickler and the fact that many of the ten best students are from Asia.

The main speaker was Daryl Sprehn from SLAC.

The title of his talk was: "**Klystron Development at SLAC?**"

Daryl summarized the capabilities of the SLAC Klystron Department in detail and then went on to discuss several key developments in the history of the department. The most known klystron developed by SLAC is the 60 MW S-band klystron used in the SLAC linac. A total of 1113 such klystrons have been made to date at SLAC which represents probably the largest klystron series made for research applications. He presented some very interesting numbers for CLIC mass production from this experience. The production yield is 100 % today but it took about 100 klystrons to ring out all kinds of teething problems of this device. The typical life time of this klystron is 60 khours. Most failures are connected to the high power vacuum window and the end of life of the cathode. SLAC makes about 2 tubes a month of this type.

Daryl went on to present a number of different klystrons, the klystrons used for PEP II which is a one MW cw tube at 476 MHz, a 150 MW S-band klystron developed for an S-band linear collider studied at DESY and a 93 GHz sheet beam klystron.

A second focus of the talk was the development of x-band klystrons at SLAC. The first x-band klystron was the so called XL-4, a 50 MW solenoid focused tube. A total of 16 have been build, the typical filament on time until now is about 10 khours. There is not yet a long term statistics available. About half of these klystrons are still running. A 50 MW PPM klystron has been developed as well. SLAC made an attempt to commercialize that 50 MW PPM tube by ordering two in industry (Toshiba and E2V) but both tubes would not work to specs. For NLC/GLC a 75 MW PPM klystron was developed at SLAC and KEK. Prototypes obtained specs for short periods but the tubes had many problems. Recently SLAC built a series of XL5 tubes for CERN, PSI and Trieste which is a scaled version of the XL4 to 12 GHz. The window design and the output circuit have been slightly modified for that. The tube reached its specifications and the first one is currently being installed at CERN.

Finally Daryl mentioned the sheet beam klystron development for ILC at 1.3 GHz. A beam stick was successfully built and tested but the gain section was found to be unfeasible and the project was recently stopped.