

EUROPEAN FREQUENCY AND TIME FORUM

Laurent-Guy Bernier, Observatory de Neuchatel: Good morning. This report will be very short. My goal is to give some of the people here the urge to go through the proceedings and dig out what is important for them. I can only give only a rough idea of what happened at the European Frequency and Time Forum.

It was held in Neuchatel, Switzerland in March of this year. And there were 20 percent more attendees than the year before, so you see that it is still growing. Fifteen percent of the papers were from non-European countries. And there were 11 invited papers, 67 contributed papers, 45 posters, for a total of 123. And there were 15 papers from Eastern European countries. So that gives you an idea of the proportion. Many of these papers came from Russia, but some of them were from Rumania, Poland, and Czechoslovakia. An interesting thing is that from the Eastern European countries some papers were from government agencies. But there were a few papers from industries in Russia that produced quartz crystals and instruments. So these statistics give you an idea of the health of the European Time and Frequency Forum.

For the first time, there was a tutorial on the day before the beginning of the forum. And there were three working sessions on quartz crystals, their applications in control loops and appropriate measurement techniques. And with more than 50 participants, this first tutorial was quite a success.

The opening session was marked by the excellent insight of the keynote speaker, John Vig, with his paper about driving forces affecting precise time and frequency. And another two invited papers focused on space application and telecom application. And this is a really expanding thing in the forum. There was also a paper by Dr. Reed of British Telecom about timing of digital signals and telecommunication network synchronization. And Dr. Andreyanov, from the Astro Space Center of the Lebedev Physics Institute in Moscow, gave a paper about time and frequency synchronization in the Radioastron Space VLBI satellite.

There was a full session devoted to telecom applications, and two sessions for space applications. And one interesting paper was about a European GPS overlay system for the use of GPS in civil aviation. Other sessions included information about oscillators, quartz crystals, frequency control competence, etc. There were also sessions on time scales and instrumentation; time transfer and telecom. There were reports on the use of H-masers in time scales, as compared to their cesium counterparts. Of course there were reports about time transfer using GPS and GLONASS. There were two full sessions devoted to primary cesium frequency standards. One important thing is that in Germany at the PTB, they are now operating a fourth primary standard. And all four standards agree to plus or minus 1.8 to the minus 14 accuracy.

There was significant progress in the understanding of Majorana transitions, which may be of importance in conventional as well as in new cesium frequency standards. There were several avenues to better understanding of the biases in cesium beam standards that were discussed, the configuration of the RF field, the new configuration of magnetic fields, among other things.

There was a report on optical pumping of cesium at NIST. There were reports about the new atomic fountains, especially the fountain operated at Oxford University. They obtained a two-Hz bandwidth in this fountain. There were reports also on cryogenic H- masers and

H-masers for space application.

The last thing that I will mention is that there was a session about new development in frequency standards. There is an Ytterbium ion trap operated in Germany that obtained a very narrow line, and Xenon for future optical frequency standard. Thank you.