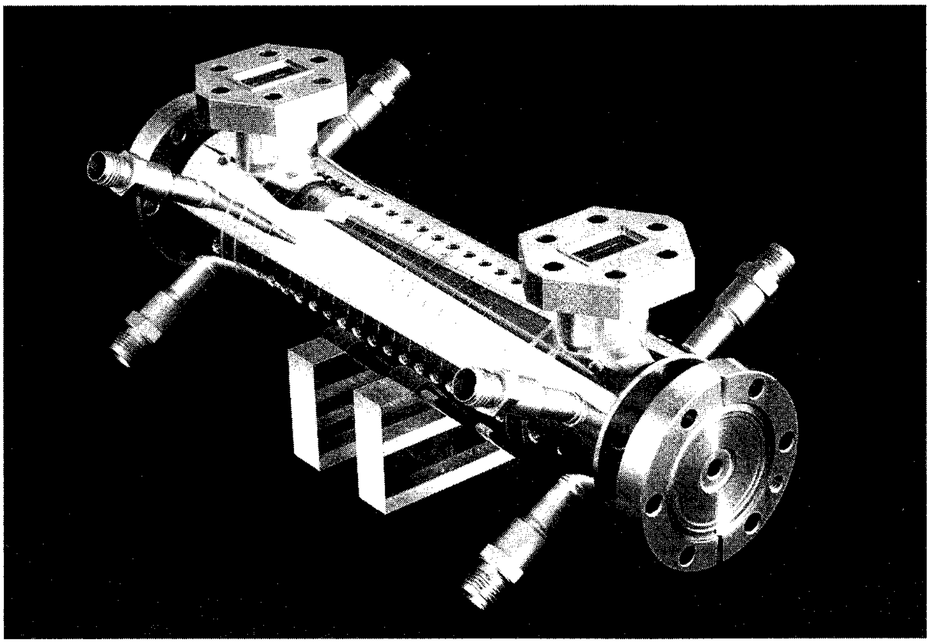
This short (20-cell) accelerating section developed by CERN's linear collider study group produced accelerating fields in excess of those required for CERN's CLIC linear electron-positron collider scheme when tested at the Japanese KEK Laboratory.
(Photo CERN AC38.4.1992)



A high gradient is an obvious design aim for any future high energy linear collider because it makes it shorter and therefore cheaper – the design figure for the CLIC machine is 80 MV/m.

The CLIC study group has taken a significant step forward in demonstrating the technical feasibility of their machine by achieving peak and average accelerating gradients of 137 MV/m and 84 MV/m respectively in a short section of accelerating structure during high gradient tests at the Japanese KEK Laboratory last year.

This result obtained within the framework of a CERN/KEK collaboration on linear colliders was obtained using a 20-cell accelerating section built at CERN using state-of-the-art technology which served both as a model for CLIC studies as well as a prototype for the Japanese Linear Collider studies.

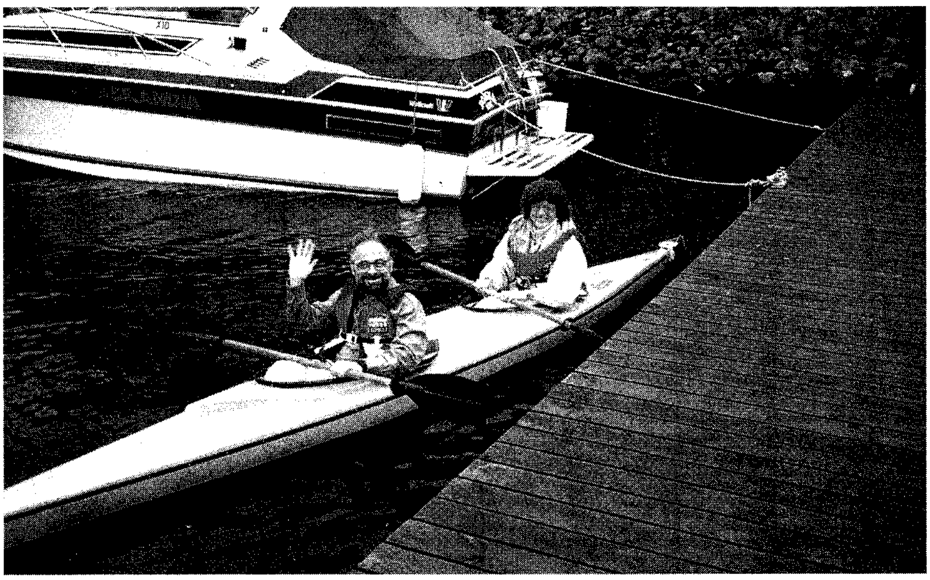
The operating frequency of the model accelerating section is 2.6 times lower than the CLIC frequency but was chosen because a high power r.f. source and pulse compression scheme has been developed for this frequency at KEK. Testing CLIC models at 11.4 GHz is however more stringent than at 30 GHz because the chance of electrical breakdown increases as the frequency is lowered. This recent result clearly demonstrates that a gradient of 80 MV/m is feasible.

CERN Accelerator school

Jyvaskyla, a university town in central Finland, was the setting for last year's General Accelerator School organized by the CERN Accelerator School. Well over a hundred students – more than for some time – followed two weeks of lectures on a broad spectrum of accelerator topics, the first step en route to becoming the designers, builders and operators of the surprisingly large number of, accelerators of all kinds either built or planned throughout Europe and further afield.

This was the fifth such school organized by CAS in a biennial cycle which alternates this introductory level with more advanced tuition. The next, advanced, school will be from 20 October – 1 November, hosted by

Albert Hofmann of CERN and CERN Accelerator School Secretary Suzanne von Wartburg at the recent CAS General Accelerator School in Jyvaskyla, Finland. How to get out of the capsized kayak position was not part of the formal curriculum but nevertheless was extensively studied.



Athens University on the Greek Island of Rhodes. (Application details will become available in Spring but would-be participants should already reserve the dates.)

After Finland, the CAS caravan moved to Benalmadena near Malaga in Spain where, together with Seville University, they organized one of the joint US-CERN schools held every two years and focusing on frontier accelerator topics. This time the subject was electron-positron factories – machines for high luminosity experiments in phi, tau-charm, beauty and Z physics. Experts from both sides of the Atlantic and from Japan shared their knowledge with an equally representative audience and probed the many intensity-related phenomena which must be mastered to reach design performance.

A number of these topics will receive extended coverage in the next specialist CAS School which is a repeat – by public demand – of the highly successful radio-frequency course held in Oxford in 1991. This school will be in Capri, Italy, with the support of the University of Naples from 29 April to 5 May. Details and application forms are now available by e-mail (CASRF@CERNVM.CERN.CH), by fax (+41 22 7824836) or from Suzanne von Wartburg, CERN Accelerator School, 1211 Geneva 23, Switzerland.

WORKSHOP
Stable particle motion

Particle beam stability is crucial to any accelerator or collider, particularly big ones, such as Brookhaven's RHIC heavy ion collider and the larger SSC and LHC proton collider schemes. A workshop on the Stability of Particle Motion in Storage Rings held at Brookhaven in October dealt with the important issue of determining the short- and long-term stability of single particle motion in hadron storage rings and colliders, and explored new methods for ensuring it.

In the quest for realistic environments, the imperfections of superconducting magnets and the effects of field modulation and noise were taken into account.

The workshop was divided into three study groups: Short-Term Stability in storage rings, including chromatic and geometric effects and correction strategies; Long-Term Stability, including modulation and random noise effects and slow-varying effects; and Methods for determining the stability of particle motion. The first two were run in parallel, but the third was attended by everyone.

Each group considered analytical, computational and experimental methods, reviewing work done so far, comparing results and approaches and underlining outstanding issues. By resolving conflicts, it was possible to identify problems of common interest.

The workshop reaffirmed the validity of methods proposed several years ago. Major breakthroughs have been in the rapid improvement of computer capacity and speed, in the development of more sophisticated mathematical packages, and in the introduction of more powerful analytic approaches.

In a typical storage ring, a particle may be required to circulate for about a billion revolutions. While ten years

At the recent Brookhaven workshop on the Stability of Particle Motion in Storage Rings – left to right, Alex Chao (SSC), Alex Dragt (Maryland), and workshop chairman Alessandro Ruggiero of Brookhaven.