

Tandem Operation

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In 2008 the tandem accelerator (MP8 from HVEC) was running 6600 hours (275 days) for experiments. For maintenance each week 6-8 hours were scheduled but not used always. In July and August we had a 3 week routine maintenance period.

The pelletron charging chains on HE side installed in September 1990 are still in operation. In 2005 we had to replace the chains on the LE side, which were younger but close to a chain rupture due to abrasion.

A few unscheduled tank openings were necessary for:

- repair of terminal y-steerer (16/17 January),
- repair of the generating voltmeter (21 January),
- repair of foil changer III (25/26 March),
- replacement of an idler wheel (16 April),
- replacement of bearings at the low energy power transmission shaft (8 May),
- replacement of a broken resistor (23 June),
- replacement of a part of the power transmission shaft (12 until 21 November),
- replacement of 4 coils of lens 5 at the tank exit (1 until 3 December).

In November we had a problem with our Quadrupole lens 5 at the exit of our tandem. The field in a quad singlet was incorrect. It was too low at one pole and too high at one of the neighbours. We have gotten a set of four coils from the tandem at Heidelberg. After replacement we investigated the old coils. The resistance of all coils was nearly equal (0.4 ohms). Additionally the inductance was measured. Three coils had about 800 μ H, but the coil with the low field had only 150 μ H. Therefore this coil was opened for a closer look inside. The coil was filled with water and a lot of corrosion products from copper. This water was certainly highly conductive.

In May we purchased 2.5 t of SF6 from Avantec (France). About 20% of the available beam time is devoted to nuclear physics. In the field of applied physics the available

beamtime is distributed to AMS (19%), materials analysis (20%), irradiation of fuel plate samples for the FRM-II (15%) and biology (15%). The rest of about 11% served for detector tests for CRESST or detector tests of the Max-Planck-Institute for extraterrestrial physics for the Beppi-Colombo space mission to mercury. The instrument most frequently in use, with about 22% of available beam time, was the Q3D magnetic spectrograph for nuclear physics as well as applied physics. A fraction of 18% is used for the AMS studies at the GAMS magnet. The Microprobe SNAKE accounts for 13% of beamtime due to studies in single ion radiation of living cells.

The control system based on an ARCNET network with about 60 node computers was running very stable all the year. This control system is now working since 1988!

The beamline to target hall III was removed and the wall to the tandem hall closed with concrete blocks.

In 2008 we had 890 visitors in groups most from schools and 340 visitors at the open house.

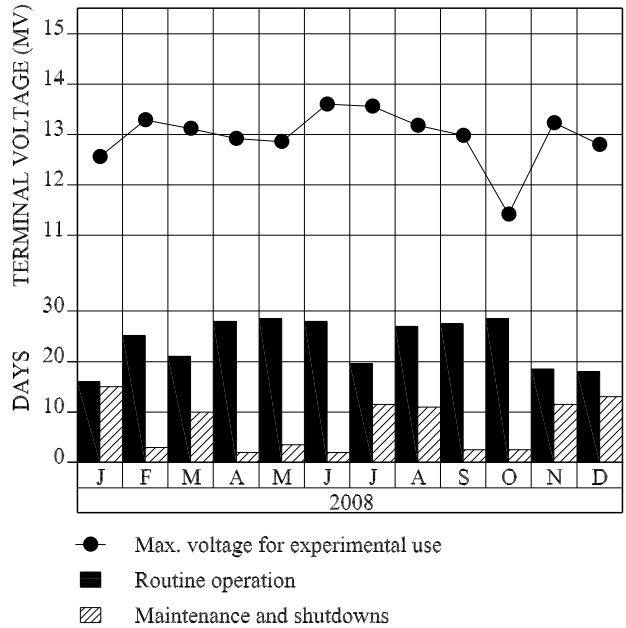


Fig. 1: Operating statistics 2008

ION	¹ H	² H	³ He	⁴ He	⁷ Li	¹¹ B	¹² C	¹⁶ O	²⁶ Al*	³⁶ Cl*
%	14.4	2.5	0.7	5.0	0.9	5.2	4.3	9.0	0.9	0.9
ION	⁴¹ Ca*	⁵³ Mn*	⁵⁸ Ni	⁵⁹ Ni*	⁶³ Ni*	¹²⁷ I	¹⁹⁷ Au	²⁴⁴ Pu*	others	
%	2.2	2.9	2.3	0.9	1.8	23.4	12.4	7.7	2.3	

Table 1: 2008 ion beam time in percent of total available beam time. The isotopes marked with an * were measured in AMS studies. The ion source for polarized Protons and Deuterons delivered about 70% of all Protons and Deuterons in a running time of about 800h.