4	ECR ion source	
4.1	Installation of the new buncher	First half of 2008
4.2	Execution of the contract for a new ECR ion source	2008
4.3	Factory test of the new ECR ion source	Second half of 2008
5	RF generators	
5.1	Project of a new synthesizer with DDS (Direct Digital Synthesis) for RF signals	2009
5.2	Phase and amplitude noise compensation system for the RF power amplifiers	2009
5.3	Design and installation of a new water leak detection system for the RF generators	2008
6	Vacuum system	
6.1	Installation of the diffusion pump drivers	2008
7	PET	
7.1	Design of the PET radiopharmaceutical production centre	First half of 2008
7.2	Construction works	Second half of 2008
7.3	Beginning of assembling of the PET equipment	Second half of 2008
7.4	Conclusion of the project	February 2009

2. Activity report of the ECR group

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In 2007 ECR ion source worked smoothly, delivering the following ions to the cyclotron:

Ion	$^{12}C^{+3}$	$^{14}N^{+3}$	$^{16}O^{+3}$	$^{16}O^{+4}$	$^{18}O^{+4}$	$^{20}Ne^{+3}$	$^{20}Ne^{+4}$	$^{35}S^{+5}$	$^{40}Ar^{+8}$
Current on the inflector [eμA]	95	134	100	132	102	100	115	85	50

Apart from routine maintenance and cleaning of the ion source, the ECR team was involved in tests of the new buncher. The tested buncher was equipped with a cylindrical electrode of about 50 mm length, designed for ions with q/m ratio in the 0.15 – 0.18 range. For comparison, the buncher presently used at HIL has an electrode of 36 mm length, suitable for q/m ranging from 0.18 to 0.25. The ion current obtained with the new electrode was about four times larger than without the buncher (test performed with Ne^{+3} ions).

The results of the tests were used to design and construct a new buncher equipped with a double electrode: one of 36 mm length and the other one of 10 mm length, with a 4 mm long gap. The new buncher will work with ions in the q/m range from 0.15 to 0.25. The electric connections are designed in such a way that one can use both electrodes together as a single one of 50 mm length, or only one of them (36 mm), while the second one (10 mm) is connected to the mass. The new buncher will be installed and put into operation probably in May 2008.

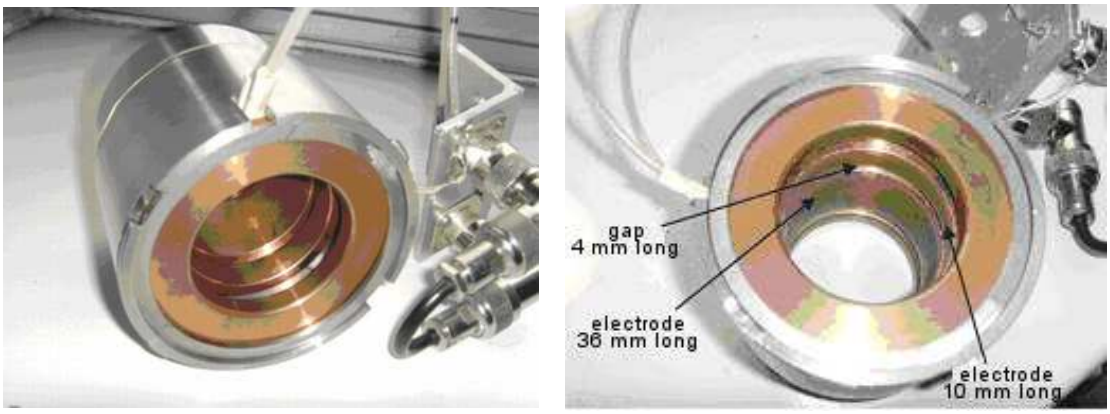

Figure 1. General view of the buncher and localization of the electrodes inside.

3. Activity report of the electrical support group

J. Kurzyński, V. Khrabrov, M. Kopka, P. Krysiak, K. Łabęda, Z. Morozowicz, K. Pietrzak

I. Design and implementation:

1. Installation of the controller for the water level in the cyclotron cooling system. Details of this project are given in HIL Annual Report 2006. Fig. 1 shows a sample screenshot of the monitoring program, presenting water levels in the graphical mode. Results of a water pressure measurement performed after changes in the cooling system done in September 2007 are given in Table 1.
2. Maintenance of power circuits and automatics of emergency water dump system. Redesigning of automatics and other adaptation works indispensable for installing the new pumps.
3. Design and implementation of the new elements of the power supply line for ICARE set-up. Details will be given in an internal report.
4. Installation of the second (final) controller for the power supply of the main magnet (ZM1).