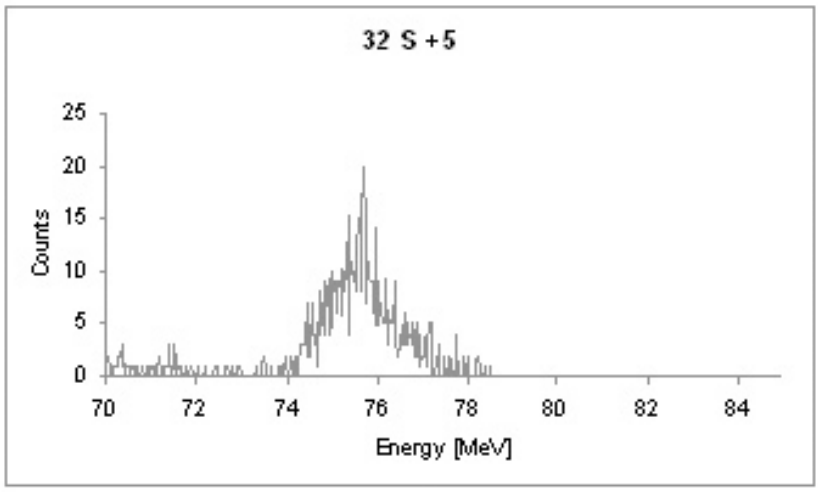

Figure 2. A sample spectrum from the beam scattering set-up ($^{32}S^{+5}$ beam). To calculate the beam energy, the energy of scattered ions measured by the detector should be divided by a factor resulting from the scattering kinematics. In this case the factor is equal to 0.91, therefore E = 75.6 MeV / 0.91 = 83.1 MeV.

The third device, installed on the C1.1 beam line, works also on the principle of time-of-flight (TOF) measurement. This apparatus is located in the experimental set-up area, so it can be used only for IGISOL experiments.

Results of beam energy measurements performed using set-ups described above agree with each other. A comparison of such measurements for recently extracted beams is presented in Table 1.

Table 1. Comparison of beam energies determined using various diagnostic set-ups available at HIL.

ion	TOF	beam scattering	TOF at IGISOL
$^{18}O^{+4}$	82.9 ± 0.8 MeV	82.3 ± 1.6 MeV	-
$^{32}S^{+5}$	83.9 ± 0.8 MeV	83.0 ± 0.8 MeV	-
$^{16}O^{+4}$	97.8 ± 1.0 MeV	-	96.6 ± 1.0 MeV

Each method has its strengths and weaknesses. The TOF technique is convenient to use and rather precise but requires high beam intensity. The beam scattering method suffers from energy calibration uncertainty, but can be used for lower beam intensities and allows to determine other beam parameters.

References:

[1] J. Miszczak *et al.*, HIL Annual Report 2001
[2] M. Sobolewski *et al.*, HIL Annual Report 2002
[3] J. Iwanicki *et al.*, HIL Annual Report 2005

6. Computer network at HIL

J. Miszczak, Z. Kruszyński, M. Sobolewski

In 2007 the layout of the computer network at HIL was modified. What was once a single network was divided into 2 subnetworks. The first subnetwork connects servers (WWW,

DNS, file, other) and PC computers, which use Linux/Unix operating system. Public IP addresses are used throughout this network. The second subnetwork connects Windows PCs. This network uses private IP addresses served by a dedicated DHCP server. The IP traffic is routed between the subnets via a router with source network address Interestingly enough the partitioning of the network was done in software, not in hardware. All modern manageable switches have virtual lan (VLAN) capabilities - the 802.1Q standard. A switch can be divided into a number of smaller (virtual) switches. The beauty of the 802.1Q technology is that it allows overlapping of virtual switches i.e. one physical port can connect to different logical networks yet the networks are separate. Also in 2007 a few wireless access points (AP) were installed throughout the Laboratory. The AP are 802.10 b/g compliant and serve the following areas: entrance hall, both lecture rooms A and B, users' hall, the whole second floor of the B building and the hotel. For security reasons, access to the wireless network is protected by WPA encryption, pass-phrases, and MAC address filtering. Anyone whishing to use the network should contact the network administrators at HIL beforehand, to obtain necessary access codes.

7. New ECR ion source and injection line

O. Steczkiewicz, J. Choiński, P. Napiorkowski, L. Pieńkowski, J. Sura, R. Tańczyk, M. Wolińska-Cichocka

During the whole second half of the year procedures of tender for purchase of the new ECR ion source went on. At the end of the year a contractor was chosen and both sides reached an agreement in the matter of contract conditions. On 11 January 2008 the contract and Memorandum of Understanding between Heavy Ion Laboratory, Warsaw University and PANTECHNIK S.A. were signed. The contract execution is fixed for 12 November 2008. The scope of the order is the fabrication and factory acceptance test of the items listed below:

1. SUPERNANOGAN ECR,
2. RF amplifier 400W-14.5 GHz,
3. Chariot for the source,
4. Packing, transportation and insurance CIP HIL,
5. Standard factory test with gases (O, Ar, Xe) and one metallic ion (high temperature oven).

According to the conditions of collaboration described in the Memorandum of Understanding, a complementary order of items necessary to the correct operation and exploitation of the SUPERNANOGAN ECR will be placed with PANTECHNIK when funds allow it. HIL scientists will be instructed in the ion source technique and operations both during the construction and assembly periods. The planned collaboration includes also involvement of PANTECHNIK in the calculations and technical projects of the injection line, which are going to be prepared at HIL. Fabrication of some mechanical parts by the HIL workshop on the basis of PANTECHNIK project drawings is considered.

The ion species, which will be delivered by the new ECR ion source, together with available currents (in eμA) are listed in Table 1.