**Line 26** – “ from protons”, but in line 44 – (d-Mg) ???

**Replace Lines 43 – 49 with following text:**

The BM@N experiment operates as part of the NICA complex (see Fig. 2). The accelerator facility provides two different ways of injections for heavy and light ions into Nuclotron. LU-20 is used as injector of light ions (d-Mg) directly into the Nuclotron accelerator. The heavy ion linear accelerator (Liinac) inject the beam first into the Booster ring. After being accelerated up to 500 MeV the beam is injected into the Nuclotron accelerator for further acceleration up to 4.5 AGeV. After that the heavy ion beam can be delivered at the fixed target BM@N experiment or at the NICA collider.

**Line 51 Delete** “For more details see”

**Replace Lines 52 – 60 with following text:**  
The beam extracted from the Nuclotron is transported to the BM@N target in the vacuum stainless beam pipe over a distance of about 150m by a set of dipole magnets and quadrupole lenses. The final steering of the beam on the target is performed by a pair of VKM and SP-57 dipole magnets, which allow a small beam bending in vertical and horizontal plane, correspondinly. They are placed respectively at distance 7.7m and 5.7m upstream from the target (Fig. 3). In addition, a doublet of quadrupole for optimal focusing of the beam on the target is used. The quadrupole lenses are placed at about 12.5 and 10.0m upstream of the target, respectively.

**Replace Lines 61-68 with following text:**

The target is located close to the entrance pole edge of the SP-41 analyzing magnet. After the target, the beam ions are deflected by the SP-41 magnetic field **(insert formula Bdl = 3.15 Tm** at the maximum current of 2000 A) and the deflected beam pass through the whole installation also in the vacuum beam pipe. The position of the vacuum beam pipe after target is fixed and for all experiments at different beam energies the magnetic field of the analyzing magnet is adjusted correspondingly. For example, studies of the Xe + CsI collisions during the 2023 Xe run were performed at Xe beam energies of 3.0 GeV/n and 3.8 GeV/n and the current of the SP-41 was set to 1395 and 1720 A a respectively.

**Replace Lines 70-103 with following text:**

A vacuum beam pipe was integrated into the experimental setup in order to minimize the amount of scattering material in the full path of the heavy ion beam from accelerator to the end of the BM@N installation. The beam pipe has continuous vacuum in the entire beam pipe and is achieved by a single roots pump installed upstream of the 1K200 quadrupole lens. The pressure maintained during the experiment is at the level of 10−4 Torr. The ISO-K vacuum standard is adopted for flange connections. The stainless beam pipe with diameter 200 mm is used in beam transport line through the 1K200 and 2K200 quadrupole lenses and through the VKM and SP-57 corrective magnets up to the target. The vacuum level is monitored by two vacuum gauges and the data from which are recorded in the Slow Control System. The last 5m long part of the beam pipe includes vacuum boxes containing beam detectors described in the next section: two 3-way boxes for profilometers, three 3-way boxes for the Silicon Beam Tracker detectors and three 6-way boxes for the BC1, BC2, and VC trigger counters. All boxes are located outside the magnetic field of the SP-41 analyzing magnet and are made of stainless steel, while the vacuum pipe components, which are close to the target and placed in the magnet, are made of aluminum.

The bending of the beam ion trajectories by the magnetic field leads to a deflection from a straight line resulting in a few mm displacement of the beam spot in the X direction at the target location. During the assembly of the beam pipe vacuum elements, an adjustment is carried out in order to compensate for this deflection. For that purpose the corresponding grooves for the vacuum box O-rings are made slightly wider than dictated by the ISO standard and allow for slight off-center shifts of the vacuum pipe components. The target flange assembly is also made of aluminum as well as a vacuum adapter ISO 240 to 66mm that provides connection with 4.5m long carbon fiber vacuum beam pipe. The entire carbon pipe consists of four straight sections of different lengths connected to each other by flangeless carbon fiber connections, which provide the possibility to align sections at slight angles with respect to each other as shown in Figs. 4 and 5. The carbon beam pipe is suspended on two supports also made of carbon fiber and installed on two lower GEM detectors, the one closest to the target and another most downstream. The supports have adjustment units for precise positioning of the carbon beam pipe on the beam axis (Fig. 5). The carbon beam pipe is designed to sustain vacuum up to 10−4 Torr. In the straight segments the carbon pipe wall thickness is about 1mm, while in flangeless connections it reaches 2mm.

**Replace Lines 104-109 with following text:**

The last section of the beam pipe has length of about 3.2m and provides vacuum through the Outer Tracker system. It consists of three cylindrical segments with lengths of 1.2. This pipe and flanges of this section as well as the connection to the carbon beam pipe are made of aluminum. It has outer diameter of 125mm and a wall thickness of 1.5mm. At the end of this section vacuum line is closed by a 100 μm thick titanium membrane installed in a frame after an adapter (d = 125/150mm).

**Lines 116-117:**

Delene “are produced by FESTO and”

**Replace Lines 119-123 with following text:**

The target assembly placed inside the vacuum has a centering frame, which fits into the inner part of the first section of the carbon beam pipe. The targets are installed in four petals. In the normal state, all the petals are leaning along the the beam pipe axis. Carbon fiber retaining pins are 300mm long and 3mm in diameter.

**Delete sentences in Lines 129-133**

~~During the preparation of the magnet for the BM@N experiment, the original configuration of the SP-41, used in previous experiments with a streamer chamber, was significant upgraded. In particular, the camera hole in the upper pole was filled with steel to improve the uniformity of th emagnetic field, and the distance between the poles was increased by approximately 30 cm to provide the space required by the BM@N GEM chambers.~~

**Delete word “roughly “ in Line 135**

**Delete word “ correspondingly” in line 138**

**Line 148 place before Fig.7.**

**Indicate the current value in the magnet in the Fig 7 caption.**

**Fig 8. Increase vertical size of BD detector (comparable with small GEM) and shift target position more close to the end of BD.**

**Line 222.**

**Indicate value of high intensity?**

**Capture of Fig. 9.**

**Delete (n+ side of the strips)**

**Line 236**

**The chip is VATA64HDR16.2 236 (IDEAS, Norway) was chosen for the FEE …..**

**Рис. 12 разместить сразу после рис. 11. Мне кажется, это более логично.**

**Таблицу 2 разместить сразу после строки 244.**

**Line 368**

**at high ??**

**Line 370**

**at small angles ??**

**Table 5**

**Indicate time resolution and efficiency at working voltage**

**Lines 508 – 509 – place before Fig.25**

**Line 569**

**the charge distributions ~~of charged~~**

**Line 610**

**(Fig. 30, b),**

**Line 633**

**deposition in ~~either~~ the whole FHCal ~~or in its “neutron” zone~~.**

**Fig.32.**

**Поменять местами левый и правый рис. Соответственно поменять ссылки и в тексте.**

**Рис. 33**

**Нет габаритных размеров на левом рис. Поправить ссылки на этот рис.**