OPERATIONAL EXPERIENCE WITH 55 MeV PULSED RACE-TRACK MICROTRON

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RTM [1, 2] has been built following a classical scheme with two 1 T end magnets and a standing wave linac between them providing 5 MeV energy gain per pass. A 50 keV beam from an electron gun is injected into linac through a 45° magnet and a solenoidal lens. Pulse length is 6 mks, repetition rate is from 6.25 to 50 Hz. The 5 MeV electron beam after the first acceleration is reflected by the end magnet field back to the linac axis and is accelerated up to 10 MeV - the energy sufficient to bypass the linac at the next turn. The 55 MeV beam is extracted from the last orbit with a dipole of 17.5° deflecting angle. Maximum exit pulsed beam current is 3mA. The RF system is based on a 6 MW multibeam klystron KIU-168. A pumping port, a vacuum window, and a circulator are installed between the linac and the klystron. Parameters of the vacuum window and the circulator during commissioning restricted the maximum RF power transported to the linac by 2.5 MW and thus restricted a. To simplify the RF system we use a auto-oscillation mode of klystron operation with accelerating structure in a feed-back loop.

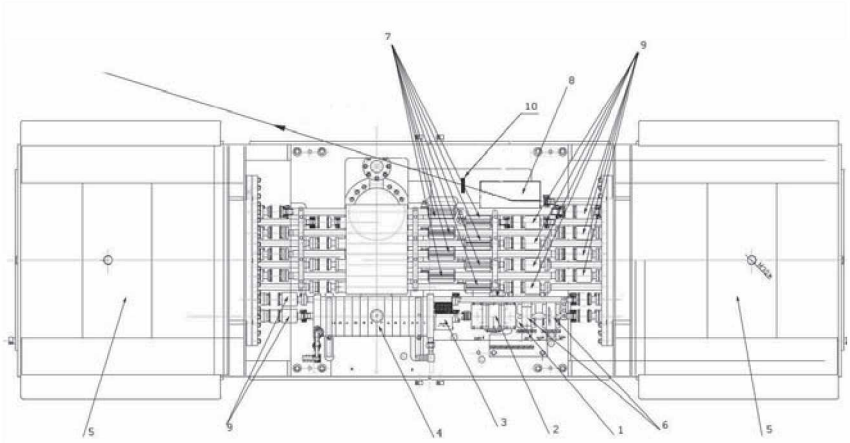

Fig. 1. RTM scheme. 1 – electron gun, 2 – injector magnet, 3 – solenoidal lens, 4 – linac, 5 – end magnet, 6 – quadrupole lens, 7 – steering coils, 8 – extraction magnet, 9 – beam current monitors, 10 – experimental place.

1. A.I.Karev, A.N.Lebedev, V.G.Raevsky, *et al.* // RuPAC. 2010. P.316.
2. V.V.Khankin, N.I.Pakhomov, V.I.Shvedunov, *et al.* // RuPAC. 2012. P.538.