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Computer simulation of pressure distribution and ion beam efficiency in accelerator vacuum chambers for designing vacuum system of cyclotron complexes

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The main parameters of vacuum systems for heavy ion cyclotron complexes are determined by means of computer programs GENAP and VACLOS that were developed and tested on the basis of experiments on four heavy ion cyclotrons of the FLNR. They estimate ion beam losses based on both the numerical simulation of pressure distribution in vacuum chambers practically of any arbitrary geometry and calculation of cross sections for a recharge of ions on the residual gases and were used for design of the vacuum systems of accelerators, such as the DC-72 (Slovak Republic), CYTREC cyclotron complex (Dubna), the DC-60 (Astana University in the Republic of Kazakhstan), the DC-110 (Dubna Centre of Nano & Nuclear Technology) and the DC-280 heavy ion cyclotron complex, which is now being launched at the FLNR, JINR.

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