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## Experimental study of multinucleon transfer reactions induced by <sup>209</sup>Bi

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Nowadays applying of multinucleon transfer reactions (MNT) in collisions between heavy nuclei are supposed to be a promising approach to produce new neutron-rich nuclei including nuclei near the N = 126 shell closure. The investigation of the properties of these nuclei is very important for understanding of nucleosynthesis processes. To reach the «island of stability» using of heavy systems in MNT reactions such as  $^{238}\text{U} + ^{238}\text{U}$  and  $^{238}\text{U} + ^{248}\text{Cm}$  [1] are often proposed for synthesis of new neutron-rich superheavy nuclei. Recently the measurements of transfer reactions in the lighter system  $^{136}\text{Xe} + ^{238}\text{U}$  at incident energy of  $^{136}\text{Xe} \text{E}_{lab} = 1.11$  GeV [2] were performed using CORSET setup [3], where the transfer up to 26 nucleons from projectile to target was observed.

For further investigations of MNT reactions to produce new heavy nuclei and observe some special features of near-symmetric collisions in the Flerov Laboratory of Nuclear Reactions at CORSET setup the <sup>209</sup>Bi + <sup>197</sup>Au, <sup>208</sup>Pb, <sup>238</sup>U reactions at incident energies above the Coulomb barrier have been measured. Using time-of-flight method mass and energy distributions of survived binary reaction products have been obtained as a result of the measurements. The obtained experimental results and the comparison with theoretical calculations performed within the multidimensional dynamical model of nucleus-nucleus collisions based on the Langevin equations [4] are presented.

[1] V.I. Zagrebaev and W. Greiner, Phys. Rev. C 83, 044618 (2011).

[2] E.M. Kozulin et al., Phys. Rev. C 109, 034616 (2024).

[3] E.M. Kozulin et al., Instrum. Exp. Tech. 51, 44 (2008).

[4] A.V. Karpov and V.V. Saiko, Phys. Rev. C 96, 024618 (2017).

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