PHYSICAL PROBLEM TO BE CLARIFIED AT ACCULINNA-2 FRAGMENT SEPARATOR

Andrey Fomichev[1] for ACCULINNA-2 Collaboration

[1]Flerov Laboratory of Nuclear Reaction Joint Institute for Nuclear Research, Dubna Russia

Fragment separator ACCULINNA-2 was newly built in FLNR JINR. The capacity of this set-up to grant the projected high transmission level of radioactive ion beam (RIBs) will be tested in
2016. Thus, it is timely now to choose meaningful and challenging objectives for experiments
dedicated to the study of light, drip-line nuclei. Discussed are experiments designed for the collection of accurate information allowing one to clarify the problem of the breakdown of shell model occurring in the vicinity doubly magic ^{10}He. Accumulation of high-statistics data for the
^{9}He and ^{10}He excitation spectra populated in the ^{2}H(^{8}He,p)^{9}He and ^{3}H(^{8}He,p)^{10}He reactions, as
well as the study of cross-check reactions made with the ^{11}Li and ^{14}Be beams, will make an effective way to clarify the succession of ^{10}He excited states. A hot topic beyond the neutron drip line makes the observation of better quality experimental result capable to elucidate the low- energy resonance states which are predicted to be inherent to the ^{16}Be and ^{26}O *2n*-emitter nuclei and to ^{7}H *4n* emitter. The RIB beams provided by the separator will allow one to design experiments where luminosity coming to a level of more than 2×10^{25} cm^{-2} c^{-1} will be achievable for the ^{3}H(^{14}Be,p)^{16}Be and ^{4}He(^{11}Li,2α)^{7}H reactions. Another reaction, ^{2}H(^{8}He,^{7}He)^{7}H, will be investigated in experiments achieving a luminosity level of 4×10^{26} cm^{-2} c^{-1}. On the side of
proton excess nuclei interest will be focused at first on the ^{17}Ne and ^{26}S isotopes being *2p* decay
candidates. The corresponding reactions ^{18}Ne(p,d) and ^{28}S(p,t) are foreseen for these tasks. Some simulation results and details of the proposed experiments will be reported.