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Recent applications of nuclear track emulsion

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Featuring excellent sensitivity and spatial resolution nuclear track emulsion (NTE) maintains a position of universal and inexpensive detector for survey and exploratory research (<http://becquerel.jinr.ru/>). Automatic microscopes will enable one to approach at a new level to application of NTE.

Cluster aspects of structure of light nuclei are investigated in fragmentation of nuclei with energy 1.2 A GeV are studied in NTE exposed to secondary beams of the JINR Nuclotron. The charge topology of ^{11}C dissociation is presented and compared with data on the nuclei ^7Be , $^8,^{10}\text{B}$, $^9,^{10}\text{C}$ and ^{14}N . Probabilities of occurrence of a variety of ensembles of fragments allow one to reveal their structural weights.

When testing the novel NTE a variety of physics tasks related with measurements of alpha-particle tracks were addressed. Decays of stopped ^8He nuclei, breaking-ups of ^{12}C nuclei by thermonuclear neutrons are analyzed. Splittings induced by thermal neutrons are studied in boron enriched emulsion. NTE exposed to mu-mesons at CERN.

There arises a problem calibration of ranges of heavy ions for ternary fission studies For this purpose Kr and Xe ions are implanted into emulsion at the JINR cyclotrons. Progress of analysis of NTE samples exposed to Am and Cf sources is presented.

Primary author: Dr ZARUBIN, Pavel (Joint Institute for Nuclear Research, Dubna, Russia)

Co-author: Ms ZARUBINA, Irina (JOINT INSTITUTE FOR NUCLEAR RESEARCH, Dubna, Russia)

Presenters: Ms ZARUBINA, Irina (JOINT INSTITUTE FOR NUCLEAR RESEARCH, Dubna, Russia); Dr ZARUBIN, Pavel (Joint Institute for Nuclear Research, Dubna, Russia)

Track Classification: New Facilities and Detectors