

The BECQUEREL Project for Juniors

The BECQUEREL Project at the JINR Nuclotron is devoted systematic exploration of clustering features of light stable and radioactive nuclei. We invite those who are interested to perform personal study with a microscope and exposed nuclear rack emulsion visit <http://becquerel.jinr.ru/>. In the “papers” page one can find a plenty of publications. Better save a fundamental text book <http://becquerel.jinr.ru/text/books/POWELL.pdf> (132 Mb!) to begin.... Enjoy our videos of fragmentation of relativistic nuclei in nuclear <http://becquerel.jinr.ru/movies/movies.html>. This time we solve alpha-clustering problems using low energy approaches which are relevant for new coming students.

First task is splitting of carbon-12 nuclei of emulsion composition by 14.5 MeV neutrons. It is wondering how little was done in this respect http://www.tunl.duke.edu/nucldata/HTML/A=12/12C_1990.shtml (reaction 36, b). The challenge is to reconstruct by alpha-particle ranges exited 3alpha states including the famous Hoyle state. One can find the event images we are interested on the <http://veksler.jinr.ru/becquerel/miscellanea/DVIN/dvin11.html>.

The second task is microscope measurements of decays of He-8 nuclei stopped in emulsion. This task as well as the first one opens important perspective. It is suggested to implant radioactive Li, B, C, and N nuclei in emulsion pellicles. The primary practical goal is to reconstruct the ${}^8\text{Be}$ decays by α -particle emission angles and ranges. One can follow our progress via page <http://veksler.jinr.ru/becquerel/miscellanea/8He/8He.html>. This study is just rising so not very much on this page in English. But in the bottom of the page there are first images of He-8 decays.

We shall provide you with basic knowledge of light nucleus structure, energy loss interpretation and microscope application.