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Detection of rare decays of heavy nuclei implanted into DSSSD: method of "active correlations"

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Anotace

The **D**ubna **G**as-**F**illed **R**ecoil **S**eparator is the most advanced facility in use in the field of Super Heavy Nuclei (SHN) research. During last year's IUPAC (Int. Union of Pure and Applied Chemistry) established the priority of the DGFRS experiments in the discovery of new Z=114-118 elements. Definitely, the DGFRS detection system and method of "active correlations" play a significant role in those discoveries. Author defines abstract mathematical objects, like correlation graph and incoming event matrixes of a different nature to construct in a simple form a rare event detection procedure in a more exhaustive relatively the present one, using real-time detection mode. In that case one can use every from **n(n-1)/2** correlation graph edges are used as a "trigger" for beam irradiation pauses to provide a "background free" condition to search for ultra rare alpha decays. Here **n** is a correlation graph nodes number. Schematics of these algorithms are considered. Elapsed time value is used as matrixes element for each event type. In the case of DSSSD detector based system those matrixes are of (X,Y) size, where X, Y are the numbers of horizontal and vertical strip number, respectively. Parameter monitoring system of the DGFRS, operating together with the DGFRS detection system (CAMAC, Windows, Borland's Builder C++) is considered in brief too.