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Search of Anomalies in M_{pp} Spectra of $A(\vec{p}, 2p)X$ Reaction at 500 MeV.

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Studying anomalous manifestations in mass spectra of nucleon-nucleon interactions and especially searching of dibaryon resonance states are actual problem for physicists theoreticians and experimenters.

Recently at physics centers of CIS (Former SU), France, Germany, USA and Japan quite a number of experiments have been fulfilled in order to observe the resonances in two-nucleon systems. But their results are controversially.

On the one hand they indicates to existence of dinucleon resonances in a large region of effective mass (from sum of two nucleon mass to ~ 2.9 GeV) [1,2], but on the other hand there are the experiments, which certainly do not confirm existence of such structures in M_{pp} -spectra of NV systems [3].

Solution of problem implies hard requirements to experiment: high mass resolution, large statistics and the minimal methodological limitations.

For searching of diproton structures in mass spectra from $A(\vec{p}, 2p)X$ reactions at $E_p=500$ MeV two-arm multidetector scintillation spectrometer has been developed and designed by us. This one has both a high full acceptance (~ 0.2 sr) and a mass-resolution (~ 4 MeV). Preliminary experimental data on mass distributions from $Cu(\vec{p}, 2p)X$ reaction have been obtained. Spectrum analysis demonstrates, that the displayed anomalies may not have statistical origin, and are probably related to dinucleon formation.

References

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