

The short range component of the nucleon-nucleon interaction is phenomenologically described by the effective interaction which includes the so-called Landau-Migdal parameters g' . Among the parameters, only $g'_{\Delta\Delta}$ has been left undetermined because of the scarcity of experimental information. We propose Coherent Pion Production (CPP) measurement $^{12}\text{C}(p, n\pi^+)^{12}\text{C}(\text{g.s.})$ to get quantitative information on $g'_{\Delta\Delta}$. The CPP experiment was performed at the RCNP neutron time of flight facility by involving exclusive measurement of pions and neutrons. The experimental techniques and result from the pion-neutron coincidences are described.

In order to identify the CPP events, high energy resolution is needed, especially for the pions. We have specially developed for this purpose a new pion counter of Gas Electron Multiplier(GEM) principle together with the readout electronics, and installed them in the beam swinger magnet of the neutron time of flight facility. We have successfully developed for the first time a new tracking detector of GEM counters and a read-out electronics system to allow for multi-channel processing. The detector has allowed us to achieve high spatial resolution for pions under the environment of high counting rate. The detector systems and development procedure are also described.