

# Seminargeneral

## Weak Processes of Nuclei Studied by Strong Interaction – Gamow-Teller transition, a key to open a jewel box –

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Nuclei consists of two kind of fermions, i.e., proton and neutron and they have spin. Therefore, Gamow-Teller (GT) transitions caused by a simple spin-isospin operator and have long been studied by beta-decays are specific to nuclear physics. Due to the simplicity, GT transition strength strongly reflects the structure of each state. In addition, they are the most common nuclear weak processes in the Universe. They play an important role in supernova explosions and nucleosynthesis.

Beta-decay is basic in the study of GT transitions, but they cannot access highly excited states. In the 1980s, it was found that charge-exchange reactions at intermediate energies ( $E > 100$  MeV/nucleon) and 0-degrees are sensitive to GT response of nuclei. Since 2000, we do high-resolution ( $^3\text{He}, t$ ) reaction at 140 MeV/nucleon. Splendid resolutions of  $\sim 30$  keV have been adding new pages in the study of GT transitions.

References:

Y. Fujita, B. Rubio and W. Gelletly, Prog. in Part. and Nucl. Phys. 66 (2011) 549.  
Y. Fujita, H. Fujita, T. Adachi, A. Negret et al., Phys. Rev. Lett. 112 (2014) 112502.

**An introductory seminar will also be given by Prof. Y. Fujita  
on Tuesday, September 9, 11:00 in the Marius Petrascu Seminar Room.**

**Miercuri 10 septembrie 2014, ora 11<sup>00</sup>  
Sala de seminar Marius Petrascu, DFN - TANDEM**