

743rd ASRC Seminar

Date: 平成31年1月24日(木) 10:30~

Location: 先端基礎研究交流棟1階
第1センター会議室

Speaker: 藤田 佳孝
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Title: Gamow-Teller Transitions in Nuclei: An
Overview

Abstract:

Spin and isospin are unique quantum numbers in nuclei. Therefore, Gamow-Teller (GT) excitations caused by the spin-isospin ($\sigma\tau$) operator are unique in the sense that they can reflect the critical part of nuclear structure.

GT transitions can be studied in beta decays as well as charge-exchange (CE) reactions. In CE reactions, such as (p,n) or (3He,t) reactions, the GT strengths up in the highly excited region can be accessed. In 1980s, (p, n) studies showed that the main part of the available GT strength concentrates to the GT Resonance (GTR) that has been systematically observed as a broad bump at $E_x \sim 9 - 15$ MeV. The (3He,t) reactions at RCNP have achieved one-order-of-magnitude better resolutions (~ 30 keV) compared to (p, n) reactions [2]. They have shown that the main part of the GT strength can also be concentrated in a low-lying discrete GT state called the "Low-energy Super Gamow-Teller (LeSGT) state" [3]. Largely different features of GT responses are discussed for various nuclei.

[1] J. Rapaport and E. Sugarbaker, *Annu. Rev. Nucl. Part. Sci.* 44 (1994) 109.

[2] Y. Fujita et al., *Prog. in Part. and Nucl. Phys.* 66 (2011) 549.

[3] Y. Fujita, et al., *Phys. Rev. Lett.* 112 (2014) 112502.

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