

## SECTION 5 — NUCLEAR SPECTROSCOPY

### 5.1. Isotopic spin in photonuclear reactions\*

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### 5.2. Photo-nuclear reaction cross sections for different decay channels on $^{90}\text{Zr}$

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### 5.3. Parity nonconservation in heavy nuclei and the structure of weak-interaction hamiltonians\*\*

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*Abstract:* Circular  $\gamma$  polarization in heavy nuclei ( $\text{Ta}^{181}$ ,  $\text{Lu}^{175}$ ) has been calculated using the two-body parity-nonconserving potential deduced on the basis of several weak-interaction Hamiltonians. Gauge invariance was elucidated by the Feynman-diagram analysis. The relative contributions from various nuclear single-particle states have been analyzed in detail. Short-range correlations have been approximately taken into account. Our calculation is compared with earlier calculations. According to our calculations, the Cabibbo conventional weak-Hamiltonian model seems to disagree with the  $\text{Ta}^{181}$  experiment. Other models allowing for extra neutral currents, such as d'Espagnat and the Lee model, might agree with experimental results. This conclusion depends on the sign of the theoretical result, which cannot be fixed with absolute certainty. The Oakes model seems to give absolute values which are too large.

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\* Work published in *Fizika 4* (1972) 97-111

\*\*Published in *Physical Review C 4* (1971) 661-672.