

OBSERVATION OF STRUCTURAL GAMMA QUANTA IN NEUTRON RADIATIVE DECAY

Khafizov R.U.^a, Kolesnikov I.A.^a, Nikolenko M.V.^a, Tarnovitsky S.A.^a,
Tolokonnikov S.V.^a, Torokhov V.D.^a, Trifonov G.M.^a, Solovei V.A.^a,
Kolkhidashvili M.R.^a, Konorov I.V.^b

^a *NRC «Kurchatov Institute», Russia*

^b *Technical University of Munich, Munich, Germany*

khafizov_ru@nrcki.ru

The purpose of the study of neutron radiative decay is to further advance the atomic project for which the «Kurchatov Institute» was established. In the last experiment when we first detected radiative decay events, the value of its main characteristic, decay branching ratio (BR) significantly exceeded the one calculated according to the Standard Model of Electroweak Interaction. In this experiment we were the first to measure the branching ratio (B.R.) of radiative neutron decay $B.R. = (3.2 \pm 1.6) 10^{-3}$ (where C.L. = 99.7% and gamma quanta energy threshold is equal to 35 Kev) [1]. On the other hand, theoretical calculations of this value according to the Standard Model give 1.5 times lower value [2]. Thus, in our experiment we recorded additional gamma quanta which are structural gamma quanta emitted by the quarks that a neutron consists of.

1. Khafizov R.U., et al., JETP Letters, **83**(1) (2006)5.
2. Gaponov Yu.V., Khafizov. R.U., Phys. Lett. B **379**(1996)7.