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Measurement of the $K^+ \Rightarrow \pi^0 \mu^+ \nu \gamma$ decay with OKA setup

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The $K^+ \Rightarrow \pi^0 \mu^+ \nu \gamma$ ($K\mu^3\gamma$) decay has been measured with OKA setup at the RF-separated 17.7 GeV/c momentum kaon beam of the U-70 accelerator. The data was collected in two runs in 2012-2013 yrs. and corresponds to the flux of 2.62×10^{10} “live” kaons entering the decay volume. More than 900 signal events were found in the “standard” Particle Data Group (PDG) region of 30-60 MeV energy of the emitted photon in the rest frame of the decaying kaon. Using 4.48×10^6 events sample of normalization decay $K^+ \Rightarrow \pi^0 \mu^+ \nu$ ($K\mu^3$), the branching ratio $B(K\mu^3\gamma)/B(K\mu^3)$ was found to be $(4.49 \pm 0.37(\text{stat})) \times 10^{-4}$. This value can be transformed (PDG $B(K\mu^3) = 3.352\%$) to $B(K\mu^3\gamma) = (1.51 \pm 0.12(\text{stat})) \times 10^{-5}$. Our results are preliminary, with systematic errors are being estimated.

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