

The $\gamma n \rightarrow K^0\Lambda$ reaction on a liquid deuterium target was measured in the A2 Hall of the MAMI-C electron accelerator facility at the Institute für Kernphysik in Mainz, Germany. An incident electron beam of energy 1.5 GeV was directed onto a 10- μm copper radiator to produce a *bremsstrahlung* photon beam that was tagged using the Glasgow Photon Tagger. The final-state K_S^0 and Λ were identified by their decays $K_S^0 \rightarrow 2\pi^0$ and $\Lambda \rightarrow \pi^0 n$, respectively. The three final-state π^0 s were reconstructed by detecting and analyzing the six photons resulting from their decays using the Crystal Ball multiphoton spectrometer and the TAPS detector as a forward wall. This combined detector system covered nearly 4π in solid angle. Kinematic fitting was applied to reconstruct the $\gamma n \rightarrow K^0\Lambda \rightarrow 6\gamma n$ events. The primary background reactions, $\gamma p \rightarrow K^0\Sigma^+$, $\gamma n \rightarrow K^0\Sigma^0$, $\gamma N \rightarrow \eta N$, and $\gamma N \rightarrow 3\pi^0 N$, were identified simultaneously using the 6-photon events. In order to determine the acceptance and to estimate the background reactions, a detailed Monte Carlo simulation was performed. Experimental cross sections for $\gamma n \rightarrow K^0\Lambda$ and $\gamma p \rightarrow K^0\Sigma^+$ were obtained in the energy range $E_\gamma = 9.15$ to 1.4 GeV. Results for $\gamma n \rightarrow K^0\Lambda$ were compared with theoretical predictions from two isobar models. Our results are the first experimental measurements of the differential and total cross section for $\gamma n \rightarrow K^0\Lambda$. Our measurements for $\gamma p \rightarrow K^0\Sigma^+$ are in good agreement with prior measurements but have better statistical precision.