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# rhoˆ0 photoproduction and the Qˆ2 evolution of the shape of gold nuclei

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Coherent photoproduction of vector mesons is sensitive to the shape of the target nucleus, as probed at Qˆ2 ˜ (M_V/2)ˆ2. Previously STAR presented a high-statistics measurement of d\sigma/dt for rhoˆ0 photoproduction in ultra-peripheral Au+Au collisions, and made a two-dimensional Fourier-Bessel (Hanckel) transformation to give the distribution of targets in the nucleus. Here, we study the Qˆ2 evolution of d\sigma/dt and the target distribution by dividing the rhoˆ0 signal into three different mass bins, to see how d\sigma/dt evolves with Qˆ2, and see the effect on the target distribution. With increasing Qˆ2, we expect to see a decrease in multiple interactions, which should emphasize the interior of the nucleus cmpared to measurements at lower Qˆ2.

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