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## $\rho^0$ photoproduction and the $Q^2$ evolution of the shape of gold nuclei

*Wednesday, April 18, 2018 2:00 PM (24 minutes)*

Coherent photoproduction of vector mesons is sensitive to the shape of the target nucleus, as probed at  $Q^2 \sim (M_V/2)^2$ . Previously STAR presented a high-statistics measurement of  $d\sigma/dt$  for  $\rho^0$  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  $Q^2$  evolution of  $d\sigma/dt$  and the target distribution by dividing the  $\rho^0$  signal into three different mass bins, to see how  $d\sigma/dt$  evolves with  $Q^2$ , and see the effect on the target distribution. With increasing  $Q^2$ , we expect to see a decrease in multiple interactions, which should emphasize the interior of the nucleus compared to measurements at lower  $Q^2$ .

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