Double pion photoproduction off nuclei

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The study of the invariant mass distributions of pion pairs produced in atomic nuclei has been intensively discussed in view of a possible in-medium modification of the meson, related to partial chiral restoration effects. The interpretation of the results from both hadron- and photon-induced reactions is complicated by final-state interaction (FSI) effects of the pions. New, precise results have been obtained with the Crystal Ball/TAPS experiment at the Mainz MAMI accelerator. Invariant mass distributions of the $\pi^0\pi^0$ and $\pi^0\pi^{+/-}$ pairs have been studied for ^{2}H, ^{7}Li, ^{12}C, ^{40}Ca, ^{nat}Pb targets with much improved statistical quality compared to previous experiments. The results allow for the first time to study these distributions also close to threshold for very low energetic pions, which are not much affected by FSI and thus has to separate FSI effects from -in-medium effects. As a preliminary result the dominating effect seems to be due to FSI.

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