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Coherent photoproduction of light vector meson off nuclear targets using the color dipole approach

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We study the coherent photoproduction of light vector mesons in AA collisions using the color dipole approach. We use the Glauber–Gribov formalism, however, it has to be supplemented by the gluon shadowing, since the coherence length of higher dipole Fock states is smaller than the nucleus radius. We fit this gluon shadowing to the deep inelastic structure function F_2 (E665) and ρ meson photoproduction (ALICE) data, obtaining the value $R_G(Q^2 = 0.15\,\text{GeV}^2) = 0.85$ with an excellent description of the five datapoints. We have also made predictions for the coherent photoproduction of $\rho(2S)$, $\omega(1S, 2S)$ and $\phi(1S, 2S)$ using the holographic vector meson wave functions.

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