

# DIS2023: XXX International Workshop on Deep-Inelastic Scattering and Related Subjects



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## Systematic study of the EMC effect in electron-deuteron DIS scattering with spectator nucleon tagging at the EIC

Wednesday, 29 March 2023 10:50 (20 minutes)

The mechanism of the nuclear modifications of parton densities at  $x > 0.3$  (EMC effect) observed in DIS experiments remains a major open question in QCD. In inclusive nuclear DIS,  $e + A \rightarrow e' + X$ , one observes only the average effect but cannot learn anything about the underlying nuclear interactions. In DIS on the deuteron with spectator nucleon tagging,  $e + D \rightarrow e' + X + p(n)$ , the nuclear configuration is fixed by the detected spectator momentum, and one can analyze the nuclear modifications differentially in the relative momentum/distance between the nucleons. We study the feasibility of measuring the configuration-dependent EMC effect in deuteron DIS with spectator tagging at the EIC. The BeAGLE event generator is supplied with a general virtuality-dependent parametrization of the tagged EMC effect constrained by theory and inclusive nuclear DIS data. Proton and neutron spectator tagging is simulated with the baseline EIC far-forward detector (extending earlier results reported in [1]). An analysis strategy for the tagged EMC effect is outlined (ratio observables, separation of initial- and final-state effects), and the uncertainties and impact of the measurements are quantified.

[1] A Jentsch, Zh. Tu, C. Weiss, Phys.Rev.C 104 (2021) 6, 065205

### Submitted on behalf of a Collaboration?

No

### Participate in poster competition?

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