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Prompt Photon Production as a probe of Gluon Sivers Function

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We explore the possibility of using transverse single spin asymmetries (TSSAs) arising in prompt photon production through scattering of unpolarized beams of protons/ photons off transversely polarized proton target as probes of Gluon Sivers Function (GSF). We present estimates of asymmetry at RHIC energy, both for direct and fragmentation contributions, using recent fits of GSF in case of $pp^{\uparrow}$ scattering. We present estimates of TSSA in the process $e + p^{\uparrow} \to \gamma + X$ using different parametrizations of quark and gluon Sivers function at EIC and J-lab energies and in different kinematic regions.

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