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Studies of final-state photon radiation and mixed EW + QCD higher-order corrections in the process $p\,p$, $p\bar{p} \to W^{\pm} \to \ell^{\pm}\nu$[1] CATHERINE BERNACIAK, SUNY University at Buffalo — Work has been done to extend the Monte Carlo program WGRAD2[12], which includes the complete $\mathcal{O}(\alpha)$ electroweak (EW) radiative corrections to $p\,p$, $p\bar{p} \to W^{\pm} \to \ell^{\pm}\nu$ to include multiple, soft, final-state photon radiation (mFSR) from a final state lepton as well as initial state QCD corrections up to $\mathcal{O}(\alpha_s)$. Final state multiple photon radiation is implemented via the QED structure function approach. In this way we study the combined effects of EW and QCD higher-order corrections to this process. In addition to mFSR and QCD NLO corrections, we discuss plans to model initial-state parton shower effects using the POWHEG[3] parton shower generator. With WGRAD3 one could then study effects on the W boson mass and other observables due to mixed EW + QCD corrections up to NNLO, initial-state parton showering and final-state multiple, soft photon radiation.

[1]U.Baur, S.Keller, D.Wackeroth, Phys. Rev. D59, 013002 (1999)
[2]U.Baur, D.Wackeroth, Phys. Rev. D70, 073015 (2004)
[3]P.Nason, JHEP 0411 (2004) 040, [arXiv:hep-ph/0409146]

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Catherine Bernaciak
SUNY University at Buffalo

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