

# Dark Vector Splitting Functions in Proton Bremsstrahlung

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Experiments at the Forward Physics Facility are sensitive to new weakly coupled degrees of freedom across a broad mass range. Among the various production modes in proton-proton collisions, bremsstrahlung is particularly important for dark sector degrees of freedom with masses between 0.5 and 2.0 GeV, due to mixing with hadronic resonances. In this talk, I will revisit the calculation of dark vector production via initial state radiation in non-single diffractive scattering, using an improved treatment of the splitting functions and time-line electromagnetic form factors at the proton vertex, including the dipole coupling. Resonant enhancements impact the sensitivity above the  $\rho/\omega$  mass range. The approach is benchmarked by applying an analogous calculation to model inclusive  $\rho$ -meson production. (based on 2409.09123)

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